[B] Final Examinations of Geometry and Measurement

Some Schools Examinations on Geometry

1 Cairo Governorate

Patriarchal College
Helioplis

Answer the following questions :

1 Choose the correct answer :

(1) The reflected image of the point A (– 3 , 2) in the origin point is the point À (.............. , ...)

(a) (3 , – 2) (b) (3 , 2) (c) (– 3 , – 2) (d) (2 , – 3)

(2) The reflection in the X-axis maps the point B (X , y) to the point B̀ (.............. , ...)

(a) (X , y) (b) (X , – y) (c) (– X , – y) (d) (– X , y)

(3) ✻ The measure of the exterior angle of the equilateral triangle at any one of its vertices equals ....

(a) 60° (b) 120° (c) 150° (d) 30°

(4) The image of the point (– 1 , 3) under the translation (4 , – 2) is the point (.............. , ...)

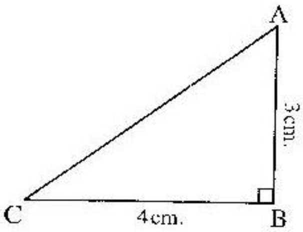
(a) (5 , – 5) (b) (5 , 1) (c) (3 , 1) (d) (3 , – 1)

(5) **In the opposite figure :**

AC = ... cm.

(a) 5 (b) 7

(c) 8 (d) 6



(6) ✻ The measure of the interior angle of a regular polygon of 10 sides equals ....

(a) 72° (b) 108° (c) 144° (d) 150°

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2 Complete :

(1) The image of the point A (4 , 3) by rotation around the origin point O and an angle whose measure is 360° is the point À (.............. , ...)

(2) If À (– 3 , – 3) is the reflected image of the point A (X , y) in the origin point (0 , 0) , then X = ... and y = ...

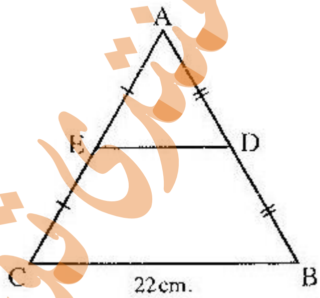
(3) The image of the point C (X , y) is the point C̀ (– X , – y) by rotation around the origin point O and an angle whose measure is ....°

(4) * If ABCD is a parallelogram in which m (∠ A) + m (∠ C) = 110°
, then m (∠ D) = ...°

(5) **In the opposite figure :**

If BC = 22 cm.

, then ED = ... cm.



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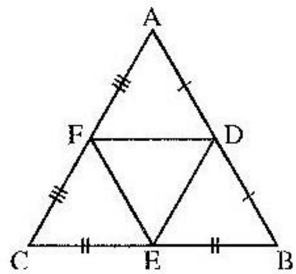
3 [a] Find $\overline{A`B`}$ the translated image of $\overline{AB}$, where A (2 , 1) and B (2 , 4) when translated MN units in the direction of $\overrightarrow{MN}$, where M (– 2 , 5) and N (3 , 7)

[b] **In the opposite figure :**

AB = 10 cm. , BC = 16 cm. , and AC = 14 cm. ,
D , E and F are the midpoints of
$\overline{AB}$, $\overline{BC}$, and $\overline{AC}$ respectively.

Prove that :

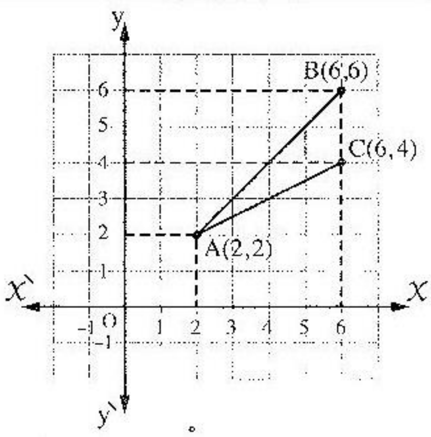
The perimeter of Δ DEF = 20 cm.



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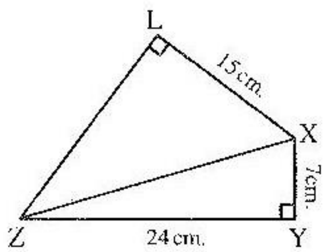
4 [a] **In the opposite figure :**

Draw the image of the Δ ABC
by the reflection in the X-axis
where A (2 , 2) , C (6 , 4)
and B (6 , 6)



[b] **In the opposite figure :**

Find the length of $\overline{LZ}$



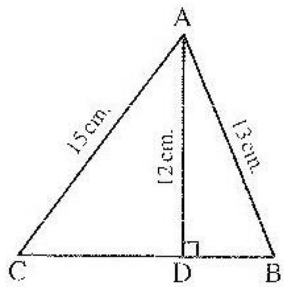
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5 [a] **In the opposite figure :**

Prove that :

(1) BC = 14 cm.

(2) Area of Δ ABC = 84 cm^2.



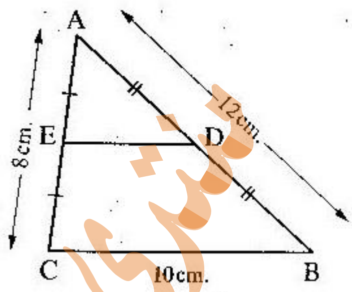
[b] In the opposite figure :

ABC is a triangle in which

AB = 12 cm. , BC = 10 cm.

and AC = 8 cm.

Find the perimeter of the triangle ADE



2 Cairo Governorate

East Nasr City Educational Zone
Futures Language School

Answer the following questions :

1 Choose the correct answer from those given :

(1) The image of the point (– 4 , 5) by translation (2 , – 3) is ....

(a) (2 , 2) (b) (– 2 , 2) (c) (2 , – 2) (d) (– 2 , – 2)

(2) The point whose image by reflection in the origin point is itself is ....

(a) (1 , 0) (b) (0 , 1) (c) (0 , 0) (d) (– 1 , 0)

(3) The image of a triangle by rotation about the origin point with an angle of measure 360° is ....

(a) point. (b) triangle. (c) line segment. (d) straight line.

(4) If ABC is right-angled triangle at B , AB = 20 cm. , AC = 25 cm. , then the length of BC = ... cm.

(a) 5 (b) 45 (c) 225 (d) 15

(5) The number of axis of symmetry of a square equal ....

(a) 0 (b) 1 (c) 2 (d) 4

(6) * ABCD is a parallelogram in which : m (∠ A) = 50° , then m (∠ B) = ...

(a) 50° (b) 120° (c) 130° (d) 40°

2 Complete the following :

(1) Rotation in the plane reserves .... of angles.

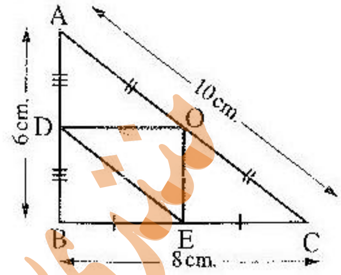
(2) The line segment joining the midpoints of two sides of a triangle is .... the third side.

(3) In the right-angled triangle , area of the square drawn on the hypotenuse equals .... of the lengths of the other two sides.

(4) * The sum of measures of the exterior angles of the hexagon equals .... °

(5) The image of the point (3 , – 8) by rotation about the origin point with an angles of measure 180° is ....

3 [a] **In the opposite figure :**

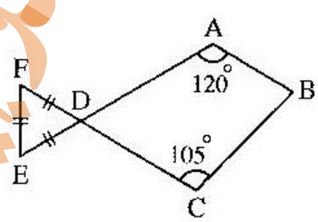


ABC is a triangle in which D , E , O are midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{AC}$ resectively , $\overline{DE}$ // $\overline{AC}$

AB = 6 cm. , BC = 8 cm. , AC = 10 cm.

Find with prove the perimeter of : Δ EDO

[b] ✻ **In the opposite figure :**



$\overline{AE} \cap \overline{CF} = \{D\}$

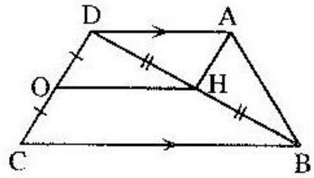
, Δ DEF is an equilateral triangle

, m (∠ A) = 120° and m (∠ C) = 105°

Find : m (∠ B)

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4 [a] **In the opposite figure :**

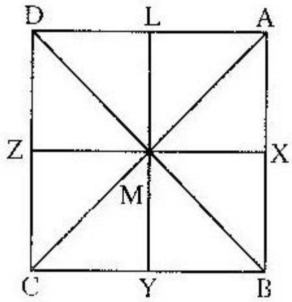


$\overline{AD}$ // $\overline{BC}$, AD = $\frac{1}{2}$ BC

, H and O are midpoints of $\overline{DB}$ and $\overline{DC}$ respectively

Prove that : AHOD is a parallelogram

[b] **In the opposite figure :**



ABCD is a square X , Y , Z , L are midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CD}$ and $\overline{DA}$ respectively

Find :

(1) The image of Δ AML by translation with a magnitude AM in direction $\overrightarrow{AM}$

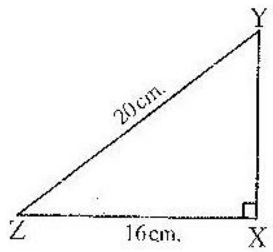
(2) The image of Δ AML by rotation about the point M with an angle of measure – 90°

(3) The image of Δ AML by reflection in $\overleftrightarrow{LY}$

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5 [a] Draw Δ OBC on a square lattice where O (0 , 0) , B (3 , 0) , C (0 , 4) , then draw its image by rotation about the origin point with an angle of measure 180°

[b] **In the opposite figure :**



XYZ is right-angled triangle at X

, YZ = 20 cm. , XZ = 16 cm.

Find : the length of $\overline{XY}$

3 Cairo Governorate

Zietoun Educational Administration
Gomhouria Language School

Answer the following questions :

1 Choose the correct answer :

(1) The line segment joining the midpoints of two sides of a triangle is .... the third side.

(a) bisect to (b) perpendicular (c) equal to (d) parallel to

(2) The image of a rhombus by any translation is a ....

(a) rhombus. (b) rectangle. (c) square. (d) trapezium.

(3) ABC is a triangle in which m $(\angle A) = 90°$, then $(AC)^2 = (BC)^2$ .... $(AB)^2$

(a) + (b) – (c) × (d) ÷

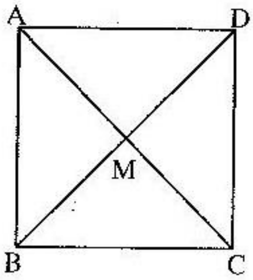
(4) **In the opposite figure :**

ABCD is a square , $\overline{AC} \cap \overline{BD} = \{M\}$

, the image of Δ AMD by rotation R (M , 90°) is ....

(a) Δ BMA (b) Δ DMA

(c) Δ DMC (d) Δ CMB



(5) The image of the point (– 1 , 3) by reflection in y-axis is ....

(a) (1 , 3) (b) (3 , – 1) (c) (– 1 , – 3) (d) (1 , – 3)

(6) ✻ In Δ ABC : if m $(\angle A)$ + m $(\angle B) = 110°$, then m $(\angle C)$ = ...

(a) 110° (b) 90° (c) 70° (d) 55°

2 Complete each of the following :

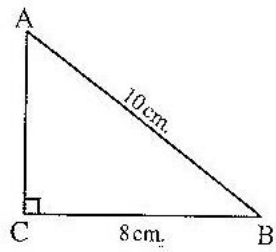
(1) In the rectangle ABCD , $(AB)^2 + (AD)^2 =$ ....

(2) ✻ The square is a .... with a right angle.

(3) The length of the line segment joining the midpoints of two sides of a triangle equals ....

(4) **In the opposite figure :**

AC = ... cm.



(5) Translation in the plane reserves .... of angles.

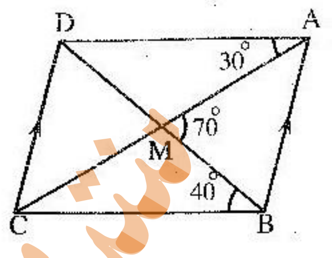
3 **[a]** ✻ **In the opposite figure :**

ABCD is a quadrilateral where : $\overline{AC} \cap \overline{BD} = \{M\}$

, $\overline{AB} // \overline{DC}$, m (∠ AMB) = 70° , m (∠ MBC) = 40°

and m (∠ MAD) = 30°

Prove that : ABCD is a parallelogram.



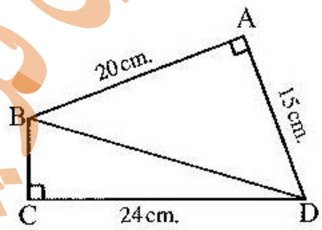
[b] **In the opposite figure :**

m (∠ A) = m (∠ C) = 90°

, AB = 20 cm. , CD = 24 cm.

, AD = 15 cm.

Find : the perimeter of Δ BCD



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4 **[a]** **Using the square lattice :**

Draw Δ ABC , where A (– 2 , 3) , B (2 , 3) , C (2 , 6) , then

Find its image by translation $(x , y) \longrightarrow (x + 2 , y - 1)$

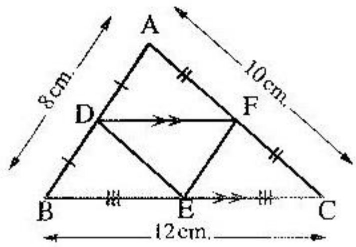
[b] **In the opposite figure :**

D , E , F are midpoints of

$\overline{AB}$, $\overline{BC}$, $\overline{CA}$ respectively

, AB = 8 cm. , BC = 12 cm. , AC = 10 cm.

Find : the perimeter of Δ DEF



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5 **In the opposite figure :**

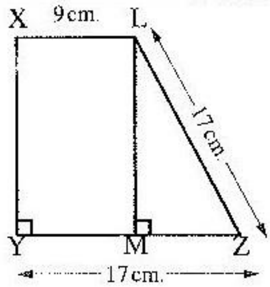
XYZL is a trapezium , in which

$\overline{XL} // \overline{YZ}$, m (∠ Y) = 90°

, $\overline{LM} \perp \overline{YZ}$, YZ = ZL = 17 cm. , XL = 9 cm.

Find : (1) The length of $\overline{XY}$

(2) The image of $\overline{XL}$ by translation of magnitude XY in the direction of $\overrightarrow{XY}$



4 Giza Governorate

Hafr EL-Baten Language Schools

Answer the following questions :

1 **Complete :**

(1) Square is a rectangle in which ....

(2) The image of the point (2 , 1) by reflection x-axis is ....

(3) The image of the point (2 , 5) by translation $(x , y) \longrightarrow (x + 2 , y - 3)$ is ....

(4) The measure of each interior angle of the regular pentagon is ....

(5) A rhombus with right-angle is called ....

2 Choose the correct answer :

(1) The number of diagonals of a quadrilateral is ....

(a) 4 (b) 3 (c) 2 (d) 0

(2) The diagonal of square divided its vertex angle in two angles of the measure of each of them is ....

(a) 30° (b) 45° (c) 60° (d) 90°

(3) The image of the point (– 3 , 5) by rotation about the origin point and with an angle of measure 90° is ....

(a) (5 , 3) (b) (– 5 , 3) (c) (3 , 5) (d) (– 5 , – 3)

(4) Any triangle has at least two .... interior angles.

(a) right (b) obtuse (c) acute (d) reflex

(5) The sum of measures of the interior angles of the pentagon is ....

(a) 540° (b) 720° (c) 360° (d) 180°

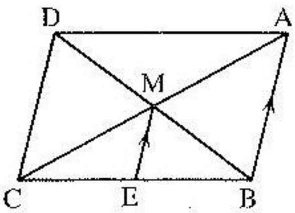
(6) * In the parallelogram XYZL , if m (∠ X) = $\frac{1}{2}$ m (∠ Y) , then m (∠ Y) = ...

(a) 120° (b) 60° (c) 90° (d) 180°

3 [a] Prove that : the ray drawn from the midpoint of a side of a triangle parallel to another side bisects the third side.

[b] In the opposite figure :

ABCD is a parallelogram its diagonals are intersect at M , $\overrightarrow{ME}$ // $\overline{AB}$ prove that BE = EC

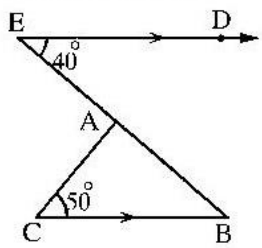


4 [a] Find the length of the diagonal of a rectangle whose area 48 cm² and of width 6 cm.

[b] In the opposite figure :

$\overleftrightarrow{ED}$ // $\overline{CB}$, m (∠ C) = 50° , m (∠ E) = 40°

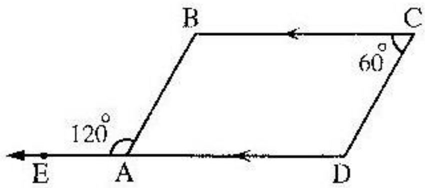
Prove that : $\overline{AC}$ ⊥ $\overline{BE}$



5 In the opposite figure :

E ∈ $\overrightarrow{DA}$, m (∠ EAB) = 120° , m (∠ C) = 60° , $\overrightarrow{DA}$ // $\overline{CB}$

Prove that : ABCD is a parallelogram



5 Giza Governorate

Omrania Directorate
EL-Sadat Governmental Language School

Answer the following questions :

1 Choose the correct answer from given ones :

(1) The image of the point (– 2 , 3) by reflection in y-axis is ....

(a) (2 , 3) (b) (– 2 , – 3) (c) (2 , – 3) (d) (3 , 2)

(2) The image of the point (– 3 , 5) by rotation about the origin point with angle of measure 90° is ....

(a) (5 , 3) (b) (– 5 , – 3) (c) (3 , 5) (d) (– 5 , 3)

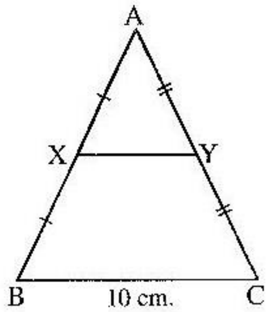
(3) In Δ ABC if m (∠ B) = 90° , AB = 6 cm. , BC = 8 cm. , then AC = ... cm.

(a) 100 (b) 8 (c) 6 (d) 10

(4) **In the opposite figure :**

X , Y are midpoints of $\overline{AB}$, $\overline{AC}$ respectively , BC = 10 cm.

, then XY = ... cm.



(a) 5 (b) 20

(c) 10 (d) 30

(5) The image of the point (2 , – 3) by translation (4 , 1) is ....

(a) (6 , 2) (b) (4 , – 2) (c) (6 , – 2) (d) (– 2 , 6)

(6) ✻ The measure of the interior angle of a regular pentagon is ....

(a) 900° (b) 108° (c) 720° (d) 540°

2 Complete each of the following :

(1) The number of axis of symmetry of square is ....

(2) In the parallelogram XYZL , if m (∠ X) = $\frac{1}{2}$ m (∠ Y) , then m (∠ Y) = ...°

(3) The line segment joining between the midpoints of two sides of triangle is ....

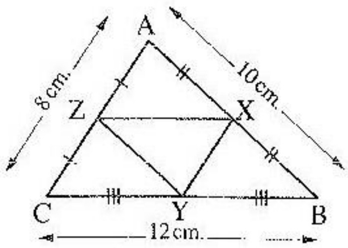
(4) The image of (3 , 7) by rotation R (O , 180°) is ....

(5) If À is the image of A by reflection in M and MA = 6 cm. , then A À = ... cm.

3 [a] **In the opposite figure :**

ABC is a triangle in which X , Y , Z are midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{CA}$, AB = 10 cm. , BC = 12 cm. , AC = 8 cm.

Find with proof : perimeter of Δ XYZ

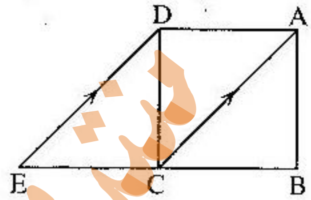


[b] ✻ In the opposite figure :

ABCD is a square , $E \in \overrightarrow{BC}$, $\overline{AC} \parallel \overline{DE}$

(1) **Prove that :** ACED is a parallelogram.

(2) **Find :** m (∠ ACE)



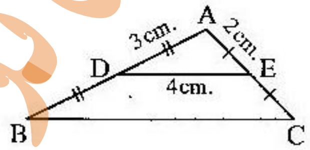
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4 **[a] In the opposite figure :**

D , E are midpoints of $\overline{AB}$, $\overline{AC}$ respectively

AD = 3 cm. , AE = 2 cm. , DE = 4 cm.

Find : the perimeter of Δ ABC

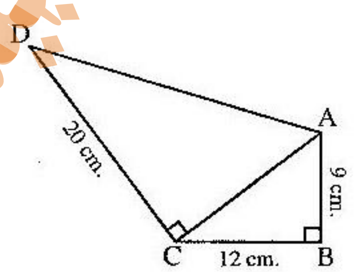


[b] In the opposite figure :

m (∠ B) = m (∠ ACD) = 90°

AB = 9 cm. , BC = 12 cm. , CD = 20 cm.

Find length of : $\overline{AC}$ and $\overline{AD}$



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5 On the square lattice draw Δ ABC where A (1 , 1) , B (4 , 1) , C (4 , 4)

, then determine each of the following :

(1) The image of Δ ABC by reflex in y-axis.

(2) The image of Δ ABC by rotation about origin point with angle of measure 180°

6 Alexandria Governorate

East Educational Zone
English Language Schools

Answer the following questions :

1 **Complete the following :**

(1) The line segment joinig the midpoints of two sides of a triangle is .... the third side.

(2) If Δ XYZ is a right angled triangle at X , XY = 12 cm. and XZ = 9 cm. , then YZ = ...

(3) ✻ If ABCD is a rhombus , then .... ⊥ ....

(4) The image of the point (– 1 , 2) by rotation about the origin point with angle of measure 90° is ....

(5) The sum of the measures of the accumulative angles about a point = ...

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2 **Choose the correct answer from those given :**

(1) If X and Y are the midpoints of $\overline{AB}$ and $\overline{AC}$ in Δ ABC and XY = 3 cm. , then BC = ... cm.

(a) 3 (b) 5 (c) 6 (d) 9

(2) The image of the point (2 , 3) by transformation $(x , y) \longrightarrow (x + 1 , y - 2)$ is the point ....

(a) (3 , 4) (b) (2 , 1) (c) (– 3 , 0) (d) (3 , 1)

(3) The image of the point (5 , 1) by reflection in the origin point is ....

(a) (1 , 5) (b) (– 1 , – 5) (c) (– 5 , – 1) (d) (– 1 , 5)

(4) The perpendicular to one of two parallel lines is .... to the other.

(a) parallel (b) equal (c) congruent (d) perpendicular

(5) The angle with measure 70° complement angle with measure ....°

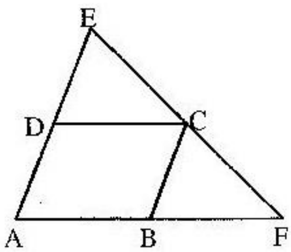
(a) 70 (b) 110 (c) 290 (d) 20

(6) ✻ The sum of measures of the exterior angles of the triangle = ...°

(a) 180 (b) 90 (c) 360 (d) 270

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3 **[a] In the opposite figure :**

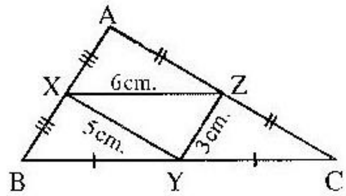


ABCD is a parallelogram

$E \in \overrightarrow{AD}$ where AD = DE , $\overrightarrow{EC} \cap \overrightarrow{AB} = \{F\}$

Prove that : EC = CF

[b] In the opposite figure :



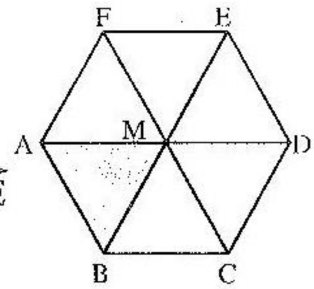
X , Y , Z are the midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CA}$ respectively.

If XY = 5 cm. , YZ = 3 cm. and XZ = 6 cm.

Find with proof the perimeter of Δ ABC

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4 **In the opposite figure :**



ABCDEF is a regular hexagon

Find the image of Δ ABM by :

(1) Reflection on $\overleftrightarrow{EB}$ (2) Translation FE in direction of $\overrightarrow{FE}$

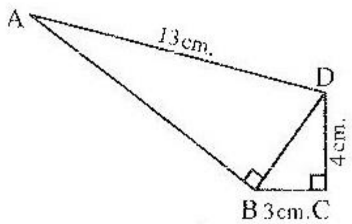
(3) Rotation (M , 120°) (4) Reflection in M

(5) Rotation (M , 300°)

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5 **[a]** In the square net draw Δ ABC in which A (– 2 , 2) , B (3 , 1) , and C (2 , 5) , then find its image by reflection in the origin point.

[b] In the opposite figure :



BC = 3 cm. , CD = 4 cm. , DA = 13 cm.

m (∠ ABD) = m (∠ C) = 90°

Find with proof the length of : $\overline{BD}$, $\overline{AB}$

7 Alexandria Governorate

Mid Educational Zone
Math's Supervision

Answer the following questions :

1 Complete each of the following :

(1) The measure of the right angle = ...°

(2) The image of the point (2 , – 1) by reflection in X-axis is ....

(3) The ray drawn parallel to one side of triangle and passing through the midpoint of another side ....

(4) ✻ In Δ ABC : If m (∠ A) + m (∠ C) = m (∠ B) , then m (∠ B) = ...

(5) The line segment joining the midpoints of two sides of a triangle is ....

---

2 Choose the correct answer :

(1) The perimeter of a square with side length 6 cm. = ... cm.

(a) 30 (b) 36 (c) 24 (d) 216

(2) The image of the point (– 1 , 3) by translation (4 , – 2) is ....

(a) (3 , 1) (b) (3 , – 1) (c) (5 , 1) (d) (5 , – 5)

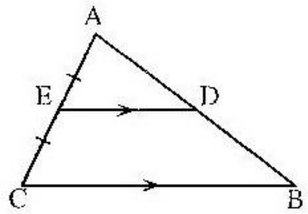
(3) The edge length of a cube whose total area is 600 cm^2. is .... cm.

(a) 10 (b) 100 (c) 300 (d) 90

(4) In Δ ABC , if m (∠ B) = 90° , AB = 3 cm. , BC = 4 cm. , then AC = ... cm.

(a) 7 (b) 1 (c) 5 (d) 4

(5) **In the opposite figure :**



ED : BC = ... : ....

(a) 1 : 1 (b) 1 : 2

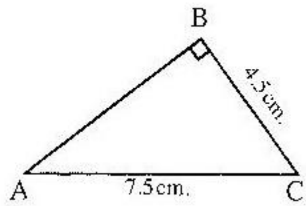
(c) 1 : 3 (d) 1 : 4

(6) ✻ The parallelogram whose two diagonals are equal in length and perpendicular is called ....

(a) rectangle. (b) square. (c) rhombus. (d) trapezium.

---

3 [a] In the opposite figure :



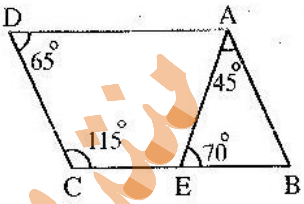
ABC is a right-angled triangle at B

, AC = 7.5 cm. , BC = 4.5 cm.

Find : the length of $\overline{AB}$

[b] Draw the image of the square ABCD where A (2 , 4) , B (2 , 1) , C (5 , 1) , D (5 , 4) by reflection in the X-axis.

4 **[a] ✻ In the opposite figure :**



$E \in \overline{BC}$, m (∠ BAE) = 45°

, m (∠ AEB) = 70° , m (∠ D) = 65°

and m (∠ C) = 115°

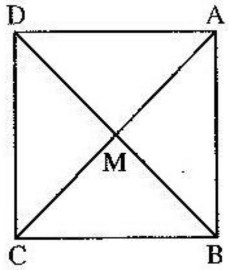
Prove that : ABCD is a parallelogram.

[b] If the image of the point A (1 , 1) by translation in the coordinate plane is Á (2 , 2)

, find the images of the points O (0 , 0) , B (4 , 2) , C (– 3 , 5) by the same translation.

---

5 **[a] In the opposite figure :**

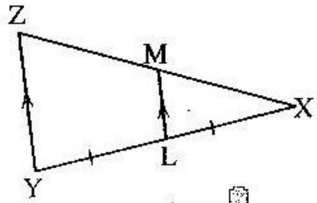


ABCD is a square

, M is the intersection point of its diagonal

, find the image of Δ MAB by rotation about M with angle 90°

[b] In the opposite figure :



L is a midpoint of $\overline{XY}$

, $\overline{LM}$ // $\overline{YZ}$, XZ = 10 cm.

Find : the length of $\overline{XM}$

8 El-Kalyoubia Governorate

Directorate of Education
Inspection of Mathematics

Answer the following questions :

1 **Complete the following :**

(1) The ray drawn from the midpoint of a side of a triangle and parallel to another side ....

(2) The image of the point (5 , – 3) by translation 3 units in negative direction of x-axis is ....

(3) (– 3 , 2) is the image of the point (– 3 , – 2) by reflection in ....

(4) ABCD is a parallelogram in which m (∠ A) = 50° , then m (∠ B) = ...

(5) If Δ XYZ in which m (∠ Y) = 90° , then $(XZ)^2$ = ... + ...

---

2 **Choose the correct answer :**

(1) The image of the point (2 , 5) by reflection in y-axis is ....

(a) (– 2 , 5) (b) (5 , 2) (c) (– 2 , – 5) (d) (2 , – 5)

(2) The measure of each angle of a regular hexagon is ....

(a) 120° (b) 136° (c) 105° (d) 90°

(3) The image of the point (3 , – 7) by reflection in the origin point is ....

(a) (– 3 , 7) (b) (– 3 , – 7) (c) (3 , – 7) (d) (3 , 7)

(4) The sum of measures of interior angles of a triangle equals ....

(a) 90° (b) 180° (c) 270° (d) 360°

(5) The number of diagonals of quadrilateral is ....

(a) 4 (b) 3 (c) 5 (d) 2

(6) * If the measure of an interior angle of a regular polygon is 135° , then the number of its sides is ....

(a) 6 (b) 4 (c) 7 (d) 8

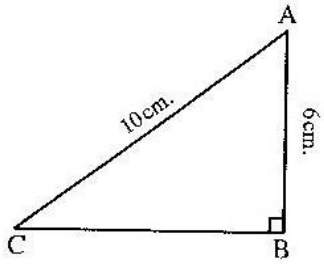
---

3 **[a] In the opposite figure :**

ABC is a triangle in which

m (∠ B) = 90° , AB = 6 cm. , AC = 10 cm.

Find with proof : the length of $\overline{BC}$

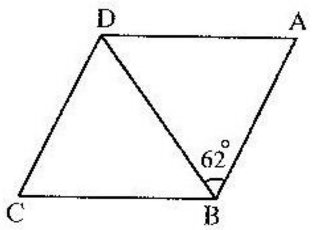


[b] * In the opposite figure :

ABCD is a rhombus , $\overline{BD}$ is a diagonal in it

, m (∠ ABD) = 62°

Find with proof : m (∠ A)



---

4 **[a] In the opposite figure :**

ABCD is a square of side length 6 cm.

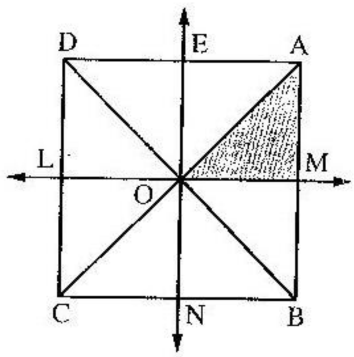
and the origin point is its centre.

Find :

(1) The image of Δ AOM by translation 3 cm. in the direction of $\overrightarrow{AB}$

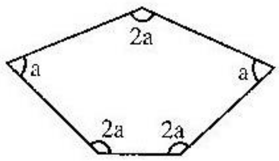
(2) The image of Δ AOM by rotation R (O , 90°)

(3) The image of Δ AOM by reflection in $\overleftrightarrow{EN}$

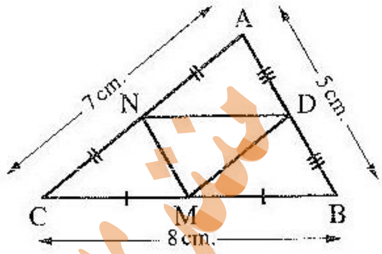


[b] * In the opposite figure :

Find the value of a



5 **[a]** **In the opposite figure :**



AB = 5 cm. , BC = 8 cm.

, AC = 7 cm. D , M , N are

the midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{AC}$

respectively find with proof the perimeter of Δ DMN

[b] Draw the triangle ABC in which AB = 3 cm. , BC = 4 cm. , m (∠ B) = 90°

, then draw its image by reflection in straight line $\overleftrightarrow{BC}$

9 El-Monofia Governorate

Maths Supervision

Answer the following questions :

1 **Choose the correct answer :**

(1) The image of the point (2 , – 1) by reflection in y-axis is ....

(a) (2 , 1) **(b)** (– 2 , – 1) **(c)** (– 2 , 1) **(d)** (2 , – 1)

(2) ABCD is a parallelogram , m (∠ A) = 70° , then m (∠ C) = ... °

(a) 110 **(b)** 35 **(c)** 70 **(d)** 140

(3) The diagonals are equal in length and perpendicular in ....

(a) square. **(b)** rhombus. **(c)** rectangle. **(d)** parallelogram.

(4) The image of the point (5 , – 3) by translation 3 units in negative direction of X-axis is ....

(a) (– 3 , 5) **(b)** (– 2 , – 3) **(c)** (2 , – 3) **(d)** (5 , 0)

(5) In Δ ABC , if D and E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively , BC = 8 cm. , then DE = ... cm.

(a) 16 **(b)** 8 **(c)** 4 **(d)** 2

(6) ✻ The triangle contains two .... angles at least

(a) acute **(b)** obtuse **(c)** right **(d)** reflex

2 **Complete each of the following :**

(1) The ray drawn from the midpoint of a side of the triangle parallel to another side ....

(2) The number of axis of symmetry of isosceles triangle = ...

(3) The image of the point .... by rotation about the origin point with an angle of measure 90° is (– 1 , 4)

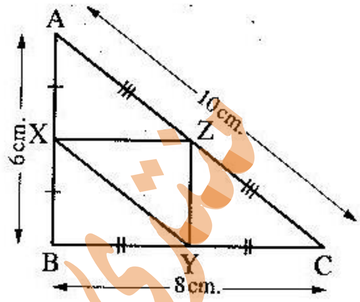
(4) The length of diagonal of a rectangle whose dimensions are 6 cm. and 8 cm. = ... cm.

(5) The translation is determined by .... and ....

3 **[a] In the opposite figure :**

X , Y , Z are midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{AC}$, AB = 6 cm. , BC = 8 cm. , AC = 10 cm.

Find : the perimeter of Δ XYZ



[b] Using the square lattice , draw the triangle ABC where A (3 , – 1) , B (5 , 2) and C (– 2 , 4) , then draw its image by rotation R (O , 180°)

---

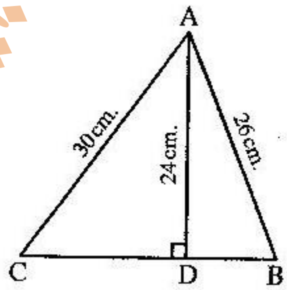
4 **[a] In the opposite figure :**

$\overline{AD} \perp \overline{BC}$, if AD = 24 cm. , AB = 26 cm. , AC = 30 cm.

Find :

(1) The length of $\overline{BC}$

(2) The area of Δ ABC

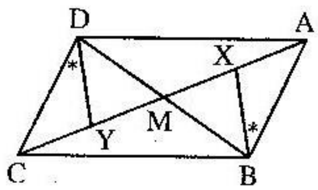


[b] In a cartesian plane draw the image of Δ ABC where A (– 2 , 3) , B (2 , 3) , C (2 , 6) by translation (x , y) ⟶ (x + 2 , y – 1)

---

5 **In the opposite figure :**

ABCD is a parallelogram , M is the point of intersection of its diagonals and X ∈ $\overline{AC}$, Y ∈ $\overline{AC}$, such that m (∠ ABX) = m (∠ CDY)



Prove that :

(1) Δ ABX is the image of Δ CDY by reflection in M

(2) The figure XBYD is a parallelogram.

10 El-Gharbia Governorate

Central Maths supervision
Official Language Schools

Answer the following questions :

1 **Choose the correct answer from those given :**

(1) The image of the point (– 3 , 5) by rotation about the origin point and with an angle of measure 90° is ....

(a) (5 , 3) (b) (– 5 , 3) (c) (3 , 5) (d) (– 5 , – 3)

(2) The image of the point (2 , – 1) by reflection in X-axis is ....

(a) (2 , 1) (b) (2 , 2) (c) (– 2 , – 1) (d) (– 1 , 2)

(3) In Δ ABC if : m (∠ A) > m (∠ B) + m (∠ C) , then the angle A is ....

(a) acute. (b) right. (c) obtuse. (d) straight.

(4) The image of the square by rotation about origin point with an angle of measure 90° is ....

(a) rectangle. (b) square. (c) rhombus. (d) trapezium.

(5) In Δ ABC if : X , Y are the midpoints of $\overline{AC}$ and $\overline{BC}$ respectively , then $\overline{XY}$ // ....

(a) $\overline{AB}$ (b) $\overline{BC}$ (c) $\overline{AC}$ (d) $\overline{CY}$

(6) The measure of the interior angle of a regular polygon of 18 sides equals ....

(a) 130° (b) 140° (c) 150° (d) 160°

---

2 **Complete each of the following :**

(1) The line segment joining the midpoints of two sides of a triangle is .... the third side.

(2) The image of the point (3 , – 2) by translation on (X – 1 , y + 6) is ....

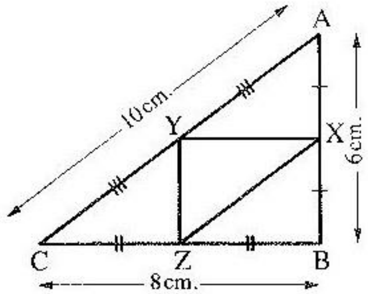
(3) The image of the point (3 , 2) by rotation with an angle of measure 180° about the origin point is ....

(4) The image of the point (4 , 1) by reflection in the origin point is ....

(5) In Δ XYZ , m (∠ Y) = 90° , then $(XZ)^2$ = ...

---

3 **[a] In the opposite figure :**

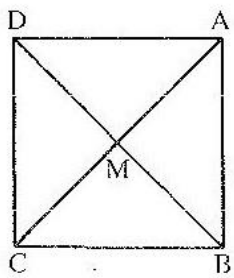


AB = 6 cm , BC = 8 cm , AC = 10 cm.

X , Y , Z are midpoints of $\overline{AB}$, $\overline{AC}$ and $\overline{BC}$ respectively

Find : the perimeter of Δ XYZ

[b] In the opposite figure :



ABCD is a square , whose diagonal intersect at M , **find :**

(1) The image of Δ ABC by reflection in $\overleftrightarrow{AC}$

(2) The image of Δ MAB by reflection in point M

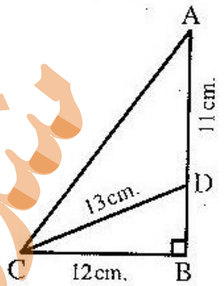
4 **[a] In the opposite figure :**

Δ ABC in which m ($\angle$ B) = 90°

D $\in \overline{AB}$ such that AD = 11 cm.

, if BC = 12 cm , DC = 13 cm.

Find the length of each of : $\overline{AB}$, $\overline{AC}$



[b] Complete :

If the point (1 , 4) is the image of the point (– 1 , 3) by a translation (x , y) , then the image of the point (3 , – 2) by the same translation is ....

---

5 **[a]** Draw Δ ABC where A (1 , 5) , B (3 , 1) and C (5 , 3) , **then draw its image :**

(1) By reflection in y-axis.

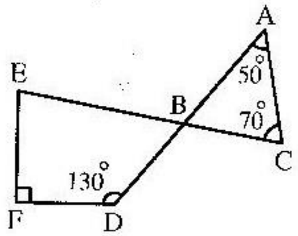
(2) By rotation about origin point with an angle of measure 180°

[b] ✻ In the opposite figure :

$\overleftrightarrow{CE} \cap \overleftrightarrow{AD} = \{B\}$, m ($\angle$ A) = 50° , m ($\angle$ C) = 70°

, m ($\angle$ D) = 130° and m ($\angle$ F) = 90°

Find : m ($\angle$ E)



11 Suez Governorate

Maths Inspectorate

Answer the following questions :

1 **Choose the correct answer :**

(1) The image of the point (2 , – 5) by reflection in x-axis is ....

(a) (– 2 , 5) (b) (2 , 5) (c) (– 2 , – 5) (d) (5 , 2)

(2) The right-angled triangle has .... right angle.

(a) 1 (b) 2 (c) 0 (d) 3

(3) The image of the point (– 3 , 5) by rotation about origin point with angle 90° is ....

(a) (– 3 , 5) (b) (– 5 , 3) (c) (3 , 5) (d) (– 5 , – 3)

(4) The hexagon has .... sides.

(a) 5 (b) 6 (c) 7 (d) 8

(5) The image of the point (3 , – 2) by translation (– 1 , 6) is ....

(a) (2 , 4) (b) (– 2 , 4) (c) (7 , – 8) (d) (2 , – 4)

(6) The measure of the interior angle of a regular pentagon = ...

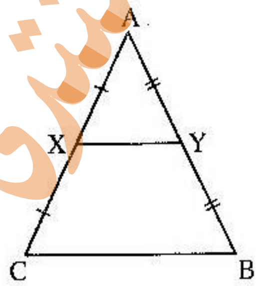
(a) 900° (b) 180° (c) 540° (d) 108°

2 Complete :

(1) In Δ ABC if m (∠ B) = 90° , then $(AC)^2$ = ... + ...

(2) **In the opposite figure :**

$\overline{XY}$ // ....



(3) The image of (3 , – 4) by reflection in y-axis is ....

(4) The ray drawn from the midpoint of a side of a triangle parallel to another side ....

(5) The image of (2 , – 1) by rotation about origin point with an angle of measure 180° is ....

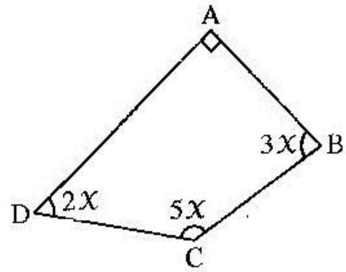
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3 [a] In the opposite figure :

ABCD is a quadrilateral

in which : m (∠ A) = 90°

Find : the value of X

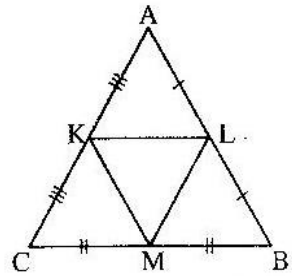


[b] In the opposite figure :

K , L , M are midpoints of $\overline{AC}$, $\overline{AB}$, $\overline{BC}$

AB = 5 cm. , BC = 8 cm. , AC = 7 cm.

Find the perimeter of : Δ KLM



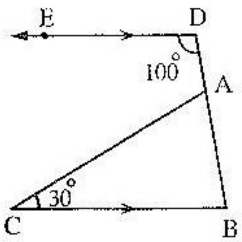
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4 [a] In the opposite figure :

$\overrightarrow{DE}$ // $\overline{BC}$, m (∠ D) = 100°

, m (∠ C) = 30° and A ∈ $\overline{DB}$

Find : m (∠ BAC)



[b] Draw Δ ABC where A (1 , 1) , B (4 , 1) , C (4 , 5) find its image by reflection in y-axis. By using square lattice.

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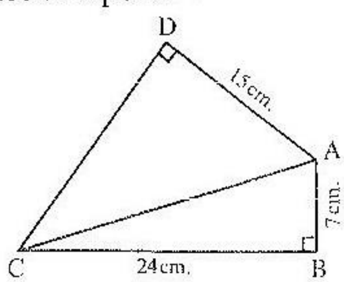
5 [a] Complete : The sum of the measures of the accumulative angles at a point = ...

[b] In the opposite figure :

m (∠ B) = m (∠ D) = 90° , AD = 15 cm.

, AB = 7 cm. , BC = 24 cm.

Find : the length of $\overline{AC}$, $\overline{DC}$



12 Damietta Governorate

Inspection Of Mathematics

Answer the following questions :

1 Choose the correct answer :

(1) The image of the point (3 , 5) by reflection in y-axis is ....

(a) (– 3 , – 5) (b) (3 , – 5) (c) (– 3 , 5) (d) (– 5 , – 3)

(2) The length of line segment joining between two midpoints of two sides of triangle = ... the length of its third side.

(a) $\frac{1}{2}$ (b) $\frac{2}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{5}$

(3) The measure of the right angle = ... °

(a) 180 (b) 90 (c) 120 (d) 0

(4) If ABC is a right-angled triangle at B , AB = 4 cm. , BC = 3 cm. , then AC = ... cm.

(a) 7 (b) 1 (c) 4 (d) 5

(5) The area of square of side length 3 cm is .... cm^2.

(a) 9 (b) 6 (c) 12 (d) 3

(6) The parallelogram whose two diagonals are .... is called a rectangle.

(a) parallel (b) perpendicular (c) equal in length (d) bisect each other

2 Complete :

(1) The image of the point (2 , 3) by rotation R (O , 90°) is ....

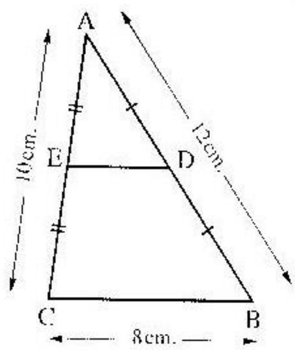
(2) The number of axis of symmetry of the square = ...

(3) Translation reserves .... of angles.

(4) If ABC is right-angled triangle at B , then $(AB)^2 = (AC)^2 -$ ....

(5) The line segment joining between two midpoints of two sides of triangle is parallel to ....

3 [a] In the opposite figure :



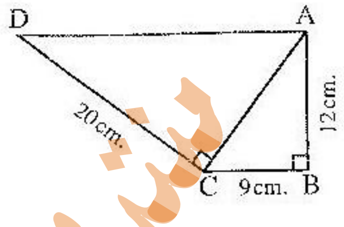
ABC is a triangle in which AB = 12 cm.

BC = 8 cm. , AC = 10 cm.

Find by proof :

the perimeter of triangle ADE

[b] **In the opposite figure :**



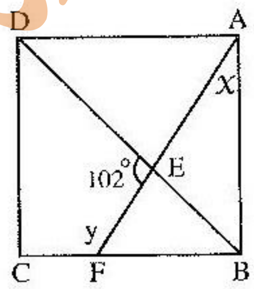
m (∠ B) = 90° , $\overline{DC} \perp \overline{AC}$

AB = 12 cm , BC = 9 cm , and CD = 20 cm.

Find by proof : the length of $\overline{AC}$ and $\overline{AD}$

---

4 [a] **In the opposite figure :**



ABCD is a square

, find in degrees the value

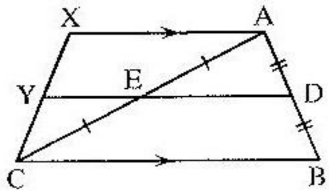
of each of X and y

[b] Draw the image of Δ ABC in which : AB = 6 cm. , BC = 4 cm. , AC = 5 cm.

, by reflection in $\overleftrightarrow{AC}$

---

5 [a] **In the opposite figure :**



AD = DB , AE = EC , $\overline{AX}$ // $\overline{BC}$

, $\overrightarrow{DE} \cap \overline{XC} = \{Y\}$,

prove that : Y is the midpoint of $\overline{XC}$

[b] If the point $\grave{A}$ (4 , 5) is the image of the point A (1 , 7) by translation

(X , y) ⟶ (X + a , y + b) **find :**

(1) The value of a and b

(2) The image of the point B (2 , – 4) by the same translation.

13 El-Beheira Governorate

General Math Supervision

Answer the following questions :

1 Choose the correct answer :

(1) The image of the point (2 , – 1) by reflection in X-axis is ....

(a) (2 , 1) (b) (1 , 2) (c) (– 2 , – 1) (d) (– 1 , 2)

(2) If the image of the point (5 , – 3) by rotation about the origin point is itself , then the measure of rotation angle is ....

(a) 90° (b) 180° (c) 270° (d) 360°

(3) The image of the point (– 1 , 3) by translation (4 , – 2) is ....

(a) (3 , 1) (b) (3 , – 1) (c) (5 , 1) (d) (5 , – 5)

(4) The smallest number of the acute angle in any triangle is ....

(a) zero (b) 1 (c) 2 (d) 3

(5) The image of the point (– 2 , 1) by reflection in the origin point is ....

(a) (2 , 1) (b) (– 2 , 1) (c) (2 , – 1) (d) (– 2 , – 1)

(6) ✻ ABCD is a parallelogram in which m (∠ A) + m (∠ C) = 100°

, then m (∠ B) = ...

(a) 50° (b) 100° (c) 130° (d) 180°

---

2 **Complete of each of the following :**

(1) The line segment joining the midpoints of two sides of triangle is .... to the third side.

(2) The image of the point (4 , 6) by translation : $(x , y) \longrightarrow (x , y - 7)$ is ....

(3) The image of the point (2 , – 4) by rotation about the origin point with an angle of measure 90° is ....

(4) The ray drawn from the midpoint of a side of a triangle parallel to another side .... the third side.

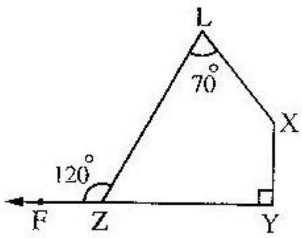
(5) In Δ XYZ if m (∠ Y) = 90° , then $(XZ)^2$ = ...

---

3 **[a] Using the square lattice :**

Draw Δ XYZ in which X (4 , 1) , Y (5 , 0) , Z (– 1 , – 2) , then draw its image by rotation about the origin point with an angle of measure (– 180°)

[b] In the opposite figure :



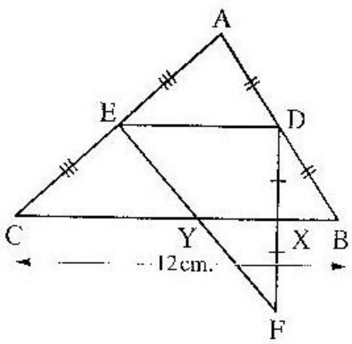
$F \in \overrightarrow{YZ}$, m (∠ L) = 70°

, m (∠ Y) = 90° and m (∠ LZF) = 120°

Find : m (∠ X)

---

4 **[a] In the opposite figure :**



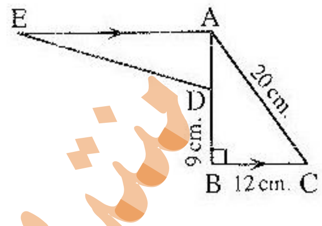
D is the midpoint of $\overline{AB}$, E is the midpoint of $\overline{AC}$

, $\overline{DF} \cap \overline{BC} = \{X\}$, DX = XF and BC = 12 cm.

Find : the length of $\overline{XY}$

[b] Find the length of the diagonal of rectangle whose area 48 cm^2 , and its width 6 cm.

5 **[a] In the opposite figure :**



Δ ABC in which m ($\angle$ B) = 90° , $\overline{AE}$ // $\overline{BC}$

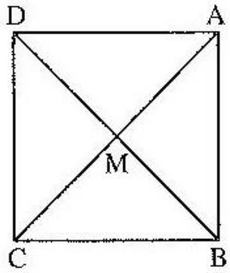
if BC = 12 cm. , AC = 20 cm. , D $\in \overline{AB}$

such that BD = 9 cm. , AE = 2 BC

Find :

(1) The length of $\overline{AD}$ (2) The length of $\overline{ED}$

[b] In the opposite figure :



ABCD is a square , whose diagonals intersect at M

Find :

(1) The image of Δ ABC by reflection in $\overleftrightarrow{AC}$

(2) The image of Δ MAB by rotation about M with angle of measure (– 90°)

14 El-Menia Governorate

Governmental Language Schools

Answer the following questions :

1 **Choose the correct answer :**

(1) The image of point (– 1 , 3) by translation (4 , – 2) is ....

(a) (3 , 1) (b) (3 , – 1) (c) (5 , 1) (d) (5 , – 5)

(2) ✻ The measure of the exterior angle of the equilateral triangle at anyone of its vertices equals ....

(a) 60° (b) 120° (c) 150° (d) 30°

(3) The image of point (3 , – 5) by reflection in y-axis is ....

(a) (3 , 5) (b) (– 3 , – 5) (c) (– 3 , 5) (d) (– 5 , 3)

(4) The image of point (– 3 , 5) by rotation about the origin point with an angle of measure (– 90°) is ....

(a) (5 , 3) (b) (– 5 , 3) (c) (3 , 5) (d) (– 5 , – 3)

(5) The image of the square by rotation about the origin point with an angle of measure 90° is ....

(a) rectangle. (b) square. (c) rhombus. (d) trapezium.

(6) The sum of measures of the exterior angles of the hexagon = ...

(a) 720 ° (b) 120 ° (c) 180 ° (d) 360 °

2 **Complete :**

(1) The ray drawn from the midpoint of a side of a triangle parallel to another side .... the third side.

(2) The line segment joining the midpoint of two sides of a triangle is .... the third side.

(3) The length of the line segment joining the midpoints of two sides of a triangle is .... the length of the third side.

(4) The image of the point (2 , – 1) by rotation about the original point with an angle of measure (– 180°) is ....

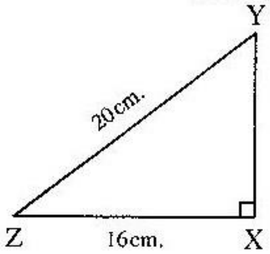
(5) (– 3 , 2) is the image of the point (3 , 2) by reflection in .... aixs.

3 **[a] In the opposite figure :**

XYZ is a triangle in which m (∠ X) = 90° ,

YZ = 20 cm. , XZ = 16 cm.

Find : the length of $\overline{XY}$



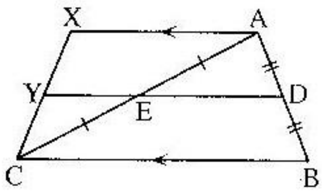
[b] Using the lattice , draw $\overline{AB}$ where A (4 , 3) , B (– 1 , 1) , then find the image of $\overline{AB}$ by translation (X , Y) ⟶ (X + 2 , Y – 1)

4 **[a] In the opposite figure :**

AD = DB , AE = EC , $\overline{AX}$ // $\overline{BC}$

, $\overrightarrow{DE}$ ∩ $\overline{XC}$ = {Y}

Prove that : Y is the midpoint of $\overline{XC}$



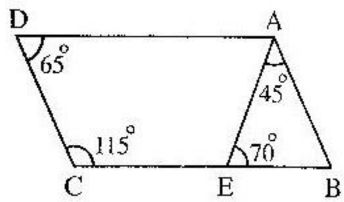
[b] In the opposite figure :

E ∈ $\overline{BC}$, m (∠ BAE) = 45° ,

m (∠ AEB) = 70° , m (∠ D) = 65°

and m (∠ C) = 115°

Prove that : ABCD is a parallelogram.

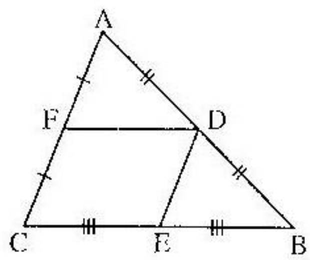


5 **[a] In the opposite figure :**

ABC is a triangle in which D , E and F are the midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{CA}$ respectively.

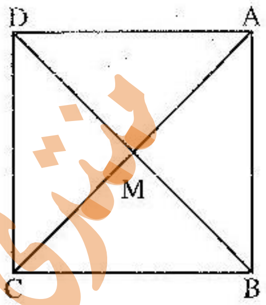
BC = 12 cm. , and AC = 10 cm.

Find : the perimeter of the quadrilateral DECF



[b] In the opposite figure :

ABCD is a square , whose diagonals intesect at M. Find the image of Δ MAB By rotation about M with angle of measure (– 90°)



15 Matrouh Governorate

Maths Supervision

Answer the following questions :

1 Complete the following :

(1) In the right-angled triangle , area of the square drawn on the hypotenuse equals ....

(2) The reflection in a line reserves .... , ...

(3) ✻ The measure of the exterior angle of a triangle is equal to the sum of ....

(4) The sum of the measures of the accumulative angles at a point is equal to ....

(5) The neutral rotation maps the figure to ....

2 Choose the correct answer from those given :

(1) The image of the point (1 , – 4) by reflection in y-axis is ....

(a) (– 1 , – 4) (b) (4 , 1) (c) (– 1 , 4) (d) (– 4 , – 1)

(2) The length of a line segment joining the midpoints of two sides of a triangle is equal to .... the length of the third side.

(a) quarter (b) half (c) third (d) double

(3) The diagonals which are equal in the length and perpendicular in ....

(a) square. (b) rhombus. (c) rectangle. (d) parallelogram.

(4) The image of the point (5 , – 3) by translation 3 units in negative direction of X-axis is ....

(a) (– 2 , – 6) (b) (2 , – 3) (c) (0 , – 6) (d) (– 6 , – 2)

(5) The triangle ABC is right-angled at B , where AB = 6 cm. , BC = 8 cm. , then AC = ...

(a) 14 cm. (b) 2 cm. (c) 10 cm. (d) 6 cm.

(6) ✻ If the measure of an interior angle of a regular polygon is 135° , then the number of its sides is ....

(a) 6 (b) 4 (c) 7 (d) 8

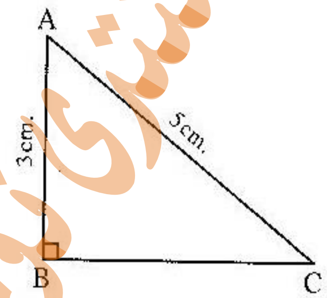
3 **[a] Complete :** Rotation in a plane reserve .... , ...

[b] ABC is a right-angled triangle at B

If AB = 3 cm.

, AC = 5 cm.

Find : the length of $\overline{BC}$



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4 **[a]** On a square lattice , draw the image of square ABDC where :

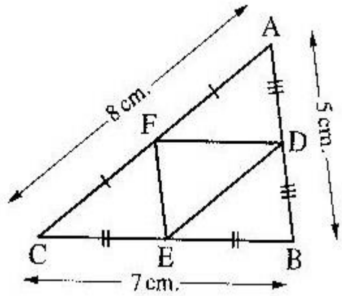
A (1 , 2) , B (– 2 , 2) , C (1 , 5) , D (– 2 , 5) by reflection in the y-axis.

[b] ABC is a triangle , D , E and F are

the midpoint of $\overline{AB}$, $\overline{BC}$, $\overline{CA}$ respectively

where AB = 5 cm. , BC = 7 cm. , CA = 8 cm.

Calculate the perimeter of Δ DEF



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5 **[a]** In the following figures , find the measure of the angle marked by (?)

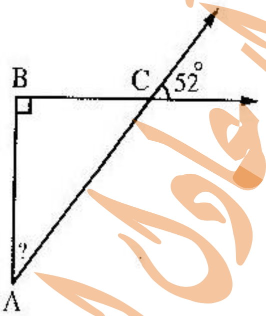


Fig (1)

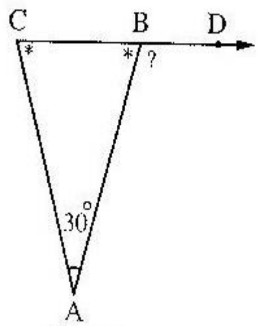


Fig (2)

[b] On a square lattice , draw the triangle ABC where A (4 , 4) , B (4 , 2) , C (1 , 2)

, then find its image by rotation about the origin point with an angle of measure 180°

Model Examinations of the School Book on Geometry and Measurement

Model 1

Answer the following questions :

1 Choose the correct answer from those given :

1. Circumference of a circle of radius 7 cm. = ... cm. $\left(\pi = \frac{22}{7}\right)$

   (a) 11 (b) 22 (c) 44 (d) 88

2. The image of the point (– 1 , 3) by translation (4 , – 2) is ....

   (a) (3 , 1) (b) (3 , – 1) (c) (5 , 1) (d) (5 , – 5)

3. The measure of the exterior angle of the equilateral triangle is ....

   (a) 30° (b) 45° (c) 60° (d) 120°

4. In a parallelogram if the adjacent sides are equal in the length , then the shape is ....

   (a) square. (b) rhombus. (c) rectangle. (d) trapezium.

5. The number of the diagonals of a pentagon is ....

   (a) 3 (b) 5 (c) 7 (d) 9

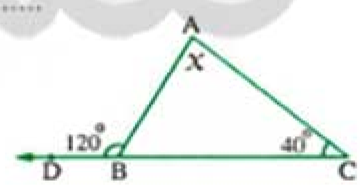
6. The number of axes of symmetry of an isosceles triangle = ...

   (a) zero (b) 1 (c) 2 (d) 3

2 Complete the following :

1. The image of the point (2 , 1) by reflection in X-axis is ....
2. **In the opposite figure :**

   X = ...°

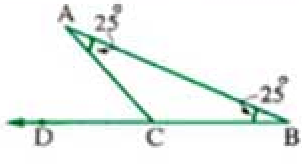


3. XYZ is a triangle in which m (∠ Y) = 90° , XY = 3 cm. , XZ = 5 cm. , then YZ = ... cm.
4. ABCD is a parallelogram in which m (∠ A) = 100° , then m (∠ B) + m (∠ D) = ...°
5. The sum of the measures of the interior angles of a triangle = ...°

3 [a] In the opposite figure :

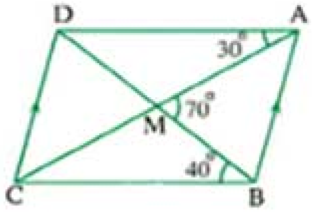
m (∠ A) = m (∠ B) = 25°

Find : m (∠ ACD)



[b] Draw a triangle ABC in which AB = 5 cm. , AC = 3 cm. and m (∠ A) = 40°
, then draw $\grave{C}$ is the image of C under rotation R (A , 40°) , $\grave{B}$ is the image of B under rotation R (A , – 40°)

4 **[a] In the opposite figure :**

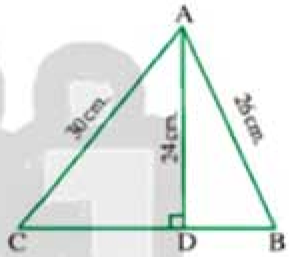


$\overline{AB}$ // $\overline{DC}$, $\overline{AC} \cap \overline{BD}$ = {M} ,
m (∠ DAC) = 30° , m (∠ DBC) = 40°
and m (∠ AMB) = 70°

Prove that : ABCD is a parallelogram.

[b] Use the translation : (x , y) ⟶ (x + 2 , y + 3)
to find the point whose image is (2 , 3)

5 **[a] In the opposite figure :**

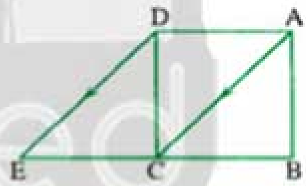


$\overline{AD} \perp \overline{BC}$, if AD = 24 cm. , AB = 26 cm. , AC = 30 cm.

1 **Find :** The length of $\overline{BC}$

2 **Find :** The area of Δ ABC

[b] In the opposite figure :



ABCD is a square , E ∈ $\overrightarrow{BC}$, $\overline{AC}$ // $\overline{DE}$

Prove that : ACED is a parallelogram.

Model 2

Answer the following questions :

1 **Choose the correct answer from those given :**

1 ABC is a right-angled triangle at B , AB = 6 cm. , BC = 8 cm. , then AC = ... cm.

(a) 10 (b) 28 (c) 100 (d) 160

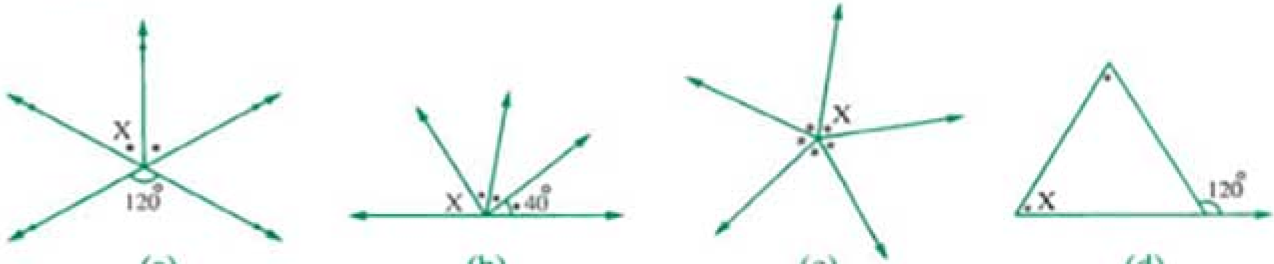
2 The measure of each angle of regular hexagon equals ....

(a) 60° (b) 108° (c) 120° (d) 135°

3 The two diagonals are equal in length and not perpendicular in ....

(a) parallelogram. (b) rectangle. (c) rhombus. (d) square.

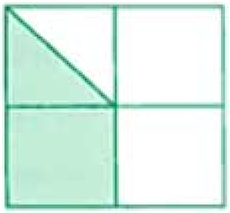
4 In all the following shapes m (∠ X) = 60° except the shape ……………



(a) (b) (c) (d)

5 **In the opposite figure :**

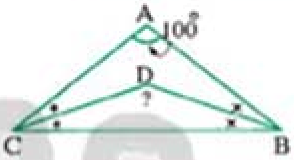
The area of the shaded part from the area of all shape equals ……………



(a) $\frac{1}{8}$ (b) $\frac{1}{4}$ (c) $\frac{3}{8}$ (d) $\frac{3}{4}$

6 **In the opposite figure :**

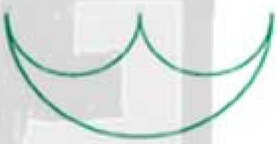
m (∠ BDC) = ……………°



(a) 60 (b) 80 (c) 100 (d) 140

2 Complete the following :

1 **In the opposite figure :**



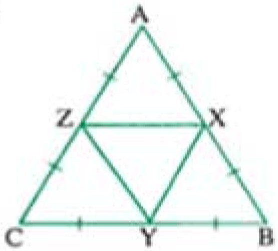
Semicircle of diameter 14 cm. and two semicircles the diameter of each is 7 cm.
, then the perimeter of the figure equals …………… cm. $\left(\pi = \frac{22}{7}\right)$

2 The image of the point (2 , 3) by translation MN , in direction $\overrightarrow{MN}$, where M (2 , – 1) , N (5 , 1) is ……………

3 The volume of a cube of side length 1.2 m. = …………… cm^3.

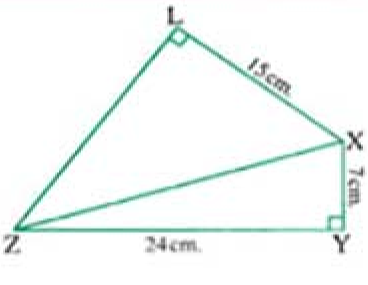
4 The ray drawn parallel to one side of a triangle and passing through the midpoint of another side ……………

5 **In the opposite figure :**



The image of the triangle XBY by translation XZ in direction $\overrightarrow{XZ}$ is ……………

3 [a] In the opposite figure :

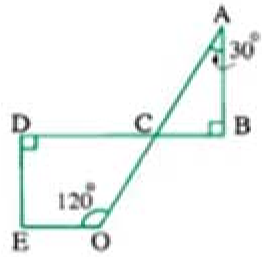


XYZL is a quadrilateral in which
m (∠ Y) = m (∠ L) = 90° , XY = 7 cm. ,
YZ = 24 cm. , XL = 15 cm.
Find : The length of each of $\overline{XZ}$ and $\overline{LZ}$

[b] Using the square lattice , draw $\overline{AB}$ where A (4 , 3) , B (– 1 , 1)
then find the image of $\overline{AB}$ by translation $(x , y) \longrightarrow (x + 2 , y - 1)$

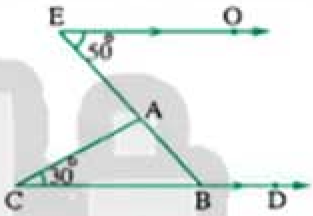
4 **[a]** Draw the image of triangle ABC where A (1 , 1) , B (3 , 4) , C (5 , 2)
by reflection in x-axis.

[b] In the opposite figure :



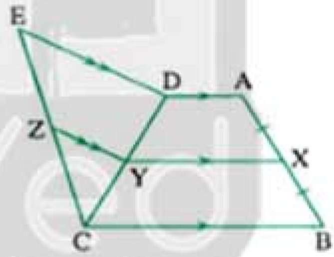
$\overline{AB}$ and $\overline{ED}$ are perpendicular to $\overline{BD}$
, $\overline{BD} \cap \overline{AO} = \{C\}$,
m (∠ A) = 30°
, m (∠ EOC) = 120° ,
Find : m (∠ E)

5 **[a] In the opposite figure :**



$\overrightarrow{EO}$ // $\overline{CD}$, m (∠ E) = 50°
, m (∠ C) = 30° ,
Find the measures of angles of Δ ABC , m (∠ ABD)

[b] In the opposite figure :



X is the midpoint of $\overline{AB}$
, Y ∈ $\overline{CD}$, Z ∈ $\overline{CE}$
, $\overline{AD}$ // $\overline{XY}$ // $\overline{BC}$, $\overline{YZ}$ // $\overline{DE}$
Is CZ = ZE ? giving reason

Model examination for the merge students

Answer the following questions :

1 Choose the correct answer :

1. The sum of the measures of the interior angles of a triangle = ...°

(a) 90 (b) 360 (c) 180 (d) 540

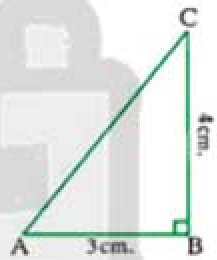
2. The image of the point (3 , – 2) by reflection in the y-axis is the point ....

(a) (3 , 2) (b) (– 3 , – 2) (c) (– 3 , 2) (d) (– 2 , 3)

3. The diagonals are equal and perpendicular in ....

(a) rhombus. (b) square. (c) recangle. (d) parallelogram.

4. **In the opposite figure :**

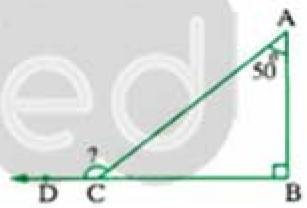


AC = ... cm.

(a) 5 (b) 7

(c) 25 (d) 625

5. **In the opposite figure :**



m (∠ ACD) = ...°

(a) 40 (b) 140

(c) 90 (d) 50

2 Complete each of the following :

1. The length of the line segment that joins two midpoints of two sides of a triangle equals .... the length of the third side.

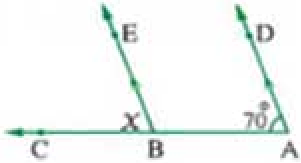
2. The rectangle is a parallelogram in which one of it's angles is ....

3. The length of the side of a rhombus whose perimeter is 24 cm. equals .... cm.

4. The image of the point A (– 3 , 2) by reflection in the origin point is the point Á (.............. , ...)

5 In the opposite figure :

x = ...°



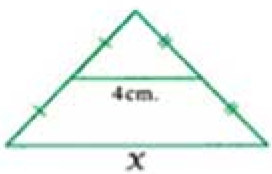
3 Put (✓) or (✗) :

1. The image of the point (4 , 3) by reflection in the x-axis is the point (3 , – 4) ( )
2. If ABC is a right-angled triangle at B , then $(AB)^2 = (BC)^2 + (AC)^2$ ( )
3. The pentagon has 5 diagonals. ( )
4. ABCD is a parallelogram , in which m (∠ A) = 70° , then m (∠ C) = 110° ( )
5. Any triangle contains at least two acute angles. ( )

4 Join from the column (A) to the suitable in the column (B) :

Column (A)	Column (B)
1 The sum of the measures of the interior angles of a quadrilateral = ...	• 120°
2 The measure of each angle of a regular hexagon = ...	• 360°
3 The image of the point (3 , 2) by translation (1 , – 2) is the point	• (– 1 , – 3)
4 The image of the point (1 , 3) by rotation about the origin point , of angle of measure 180° is the point (.............. , ...)	• 45
5 The diagonal of the square divides the angle of the vertex into two angles , the measure of each = ...°	• (4 , 0)

5 Find the value of x :



x = ... cm.

Fig. (1)



x = ...°

Fig. (2)

Schools Examinations on Geometry and Measurement

1 Cairo Governorate

East Nasr City Zone
Manaret Heliopolis School

Answer the following questions :

1 Complete :

1. The sum of measures of the exterior angles of the heptagon is ....°
2. If two lines intersect , then each two vertically opposite angles are ....
3. In Δ ABC , if m (∠ A) + m (∠ C) = m (∠ B) , then m (∠ B) = ...°
4. The image of (2 , 3) by translation (X , y) ⟶ (X + 4 , y – 2) is ....
5. The length of the line segment joining two midpoints of two sides of a triangle equals .... the length of the third side.

2 Choose the correct answer :

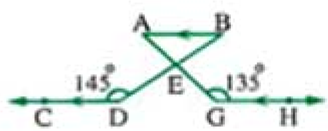
1. ABCD is a parallelogram in which m (∠ A) = 80° , then m (∠ C) = ...
   (a) 80° (b) 100° (c) 120° (d) 60°
2. If the image of the point (5 , – 3) by rotation about the origin point is itself , then the measure of the rotation angle is ....°
   (a) 90 (b) 180 (c) 270 (d) 360
3. The line segment joining two midpoints of two sides of a triangle is .... the third side.
   (a) intersecting (b) parallel to (c) perpendicular to (d) congestive
4. The sum of measures of the accumulative angles at a point is ....°
   (a) 90 (b) 180 (c) 270 (d) 360
5. If ABC is a right-angled triangle at B and AB = 4 cm. , BC = 3 cm. , then AC = ... cm.
   (a) 16 (b) 25 (c) 9 (d) 5
6. The sum of measures of the interior angles of a hexagon is ....°
   (a) 360 (b) 540 (c) 720 (d) 120

3 [a] In the opposite figure :

ABE is a triangle , $\overline{AB} \parallel \overline{GH} \parallel \overline{CD}$, m (∠ CDB) = 145°

, m (∠ AGH) = 135°

Calculate : m (∠ DEG)

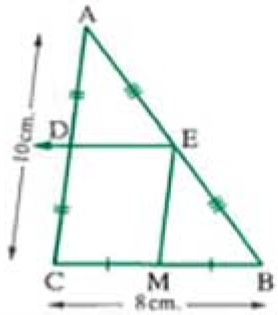


[b] In the opposite figure :

ABC is a triangle in which E , M and D are the midpoints of the sides $\overline{AB}$, $\overline{BC}$ and $\overline{CA}$ respectively

, BC = 8 cm. , AC = 10 cm.

Prove that : DEMC is a parallelogram.



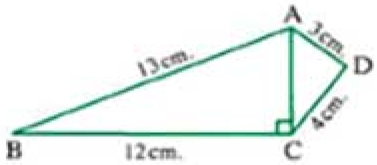
4 **[a] In the opposite figure :**

m (∠ ACB) = 90° , AB = 13 cm. , AD = 3 cm.

, CD = 4 cm. , BC = 12 cm.

Find : 1 The length of $\overline{AC}$

2 The perimeter of the figure ABCD

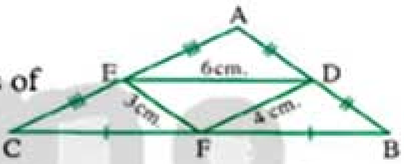


[b] In the opposite figure :

ABC is a triangle in which : D , F and E are the midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{CA}$

respectively such that : DF = 4 cm. , FE = 3 cm. , DE = 6 cm.

Calculate : The perimeter of Δ ABC



5 **[a]** Using the lattice , find the images of the points :

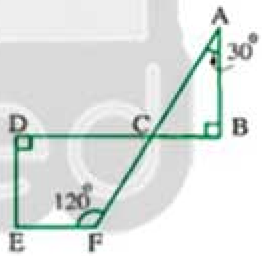
A (– 4 , 1) , B (0 , 4) and C (– 2 , 2) by reflection in X-axis.

[b] In the opposite figure :

$\overline{AB} \perp \overline{BC}$, $\overline{BD} \cap \overline{AF} = \{C\}$

, m (∠ A) = 30° , m (∠ F) = 120°

Find with proof : 1 m (∠ ACB) 2 m (∠ E)



2 Cairo Governorate

Abdeen Directorate
Patriarchal College

Answer the following questions :

1 **Choose the correct answer :**

1 The sum of the measures of the interior angles of the pentagon equals ....°

(a) 360 (b) 540 (c) 720 (d) 108

2 The two diagonals are equal in length and perpendicular in the ....

(a) parallelogram (b) rectangle (c) rhombus (d) square

3 The image of the point (4 , – 7) by reflection in X-axis is ....

(a) (4 , 7) (b) (– 4 , – 7) (c) (– 4 , 7) (d) (4 , – 7)

4 The line segment joining the midpoints of two sides of a triangle is .... the third side.

(a) parallel to (b) perpendicular to (c) bisect to (d) equal to

5 In Δ ABC , if m ($\angle$ B) = 90° , AB = 6 cm. and BC = 8 cm. , then AC = ... cm.

(a) 100 (b) 8 (c) 14 (d) 10

6 The image of the point (– 3 , 4) by rotation about the origin with an angle of measure 90° is ....

(a) (– 4 , 3) (b) (3 , – 4) (c) (– 4 , – 3) (d) (4 , 3)

2 Complete :

1 A quadrilateral in which only two opposite sides are parallel is called ....

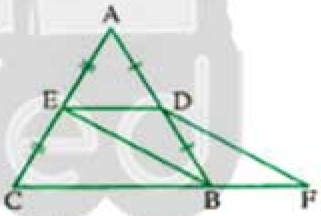
2 The measure of each angle of the regular octagon equals ....°

3 The image of the point (1 , – 5) by translation (– 4 , 6) is ....

4 If the measure of each interior angle of a regular polygon is 140° , then the number of its sides is ....

5 ABCD is a parallelogram in which m ($\angle$ A) + m ($\angle$ C) = 100° , m ($\angle$ B) = ...°

3 [a] In the opposite figure :



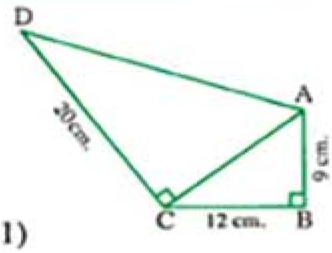
D and E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively

, F $\in \overrightarrow{CB}$, where BF = $\frac{1}{2}$ CB

Prove that : DFBE is a parallelogram.

[b] Draw the image of Δ XYZ in which XY = 3 cm. , YZ = 5 cm. and ZX = 7 cm. by reflection in the straight line containing the longest side.

4 [a] In the opposite figure :



m ($\angle$ B) = m ($\angle$ ACD) = 90°

, AB = 9 cm. , BC = 12 cm. and CD = 20 cm.

Find by proof : The length of each of $\overline{AC}$ and $\overline{AD}$

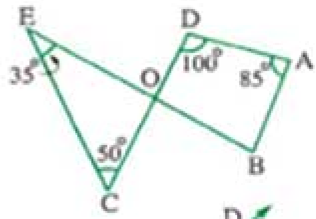
[b] In the square lattice draw Δ ABC where : A (– 4 , 2) , B (– 1 , 1) and C (– 2 , 5) , then draw its image by the translation : $(X , y) \longrightarrow (X + 5 , y - 3)$

5 **[a] In the opposite figure :**

$\overline{DC} \cap \overline{BE} = \{O\}$, m (∠ A) = 85°

, m (∠ D) = 100° , m (∠ E) = 35° and m (∠ C) = 50°

Find : m (∠ B)

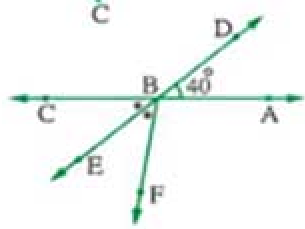


[b] In the opposite figure :

$\overleftrightarrow{AC} \cap \overleftrightarrow{DE} = \{B\}$, m (∠ ABD) = 40°

, $\overrightarrow{BE}$ bisects ∠ CBF

Find : m (∠ ABF)



3 Cairo Governorate

Hadayek El Koba Educational Zone

Answer the following questions : (Calculators are Permitted)

1 **Choose the correct answer :**

1 The measure of the interior angle of the regular octagon equals ....

(a) 1080° (b) 180° (c) 135° (d) 108°

2 If ABCD is a parallelogram in which m (∠ A) + m (∠ C)= 140° , then m (∠ B) = ...

(a) 40° (b) 110° (c) 70° (d) 60°

3 In Δ ABC , if m (∠ B) = 90° , AB = 20 cm. , AC = 25 cm. , then BC = ... cm.

(a) 625 (b) 12 (c) 15 (d) 225

4 If the perimeter of a square is 20 cm. , then its area equals .... cm^2.

(a) 25 (b) 100 (c) 5 (d) 16

5 The image of point (– 3 , 5) by rotation about origin point with an angle of measure 90° is ....

(a) (– 5 , 3) (b) (– 5 , – 3) (c) (5 , 3) (d) (3 , – 5)

6 The image of point (– 1 , 3) by translation (4 , – 2) is ....

(a) (3 , 1) (b) (3 , – 1) (c) (5 , 1) (d) (5 , – 5)

2 **Complete the following :**

1 The line segment joining the midpoints of two sides of a triangle is parallel to ....

2 The image of the point (2 , – 4) by reflection in y-axis is ....

3 The number of axis of symmetry of a rectangle is ....

4 The measure of exterior angle of an equilateral triangle equals ……………°

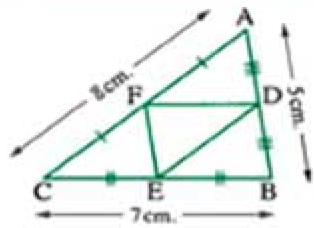
5 The volume of a cube of side length 6 cm. is …………… cm^3.

3 **[a] In the opposite figure :**

ABC is a triangle , D , E and F are midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CA}$ respectively

where AB = 5 cm. , BC = 7 cm. and CA = 8 cm.

Calculate : The perimeter of Δ DEF



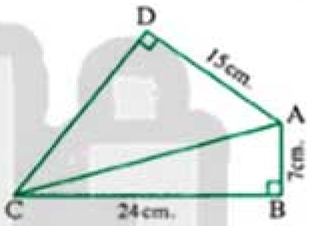
[b] On square lattice , draw the square ABCD where A (1 , 2) , B (– 2 , 2) , C (– 2 , 5) and D (1 , 5) , then draw its image by reflection in x-axis.

4 **[a] In the opposite figure :**

m (∠ B) = m (∠ D) = 90°

AD = 15 cm. , AB = 7 cm. and BC = 24 cm.

Find : The length of each of $\overline{AC}$, $\overline{DC}$



[b] Draw Δ ABC where A (1 , 5) , B (3 , 1) and C (5 , 3) , then draw its image by rotation about the origin point with an angle of measure 180°

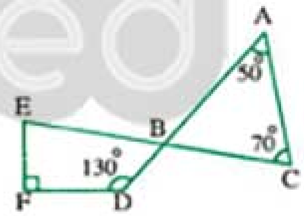
5 **[a] In the opposite figure :**

$\overline{CE} \cap \overline{AD} = \{B\}$

, m (∠ A) = 50° , m (∠ C) = 70°

, m (∠ D) = 130° and m (∠ F) = 90°

Find : m (∠ E)



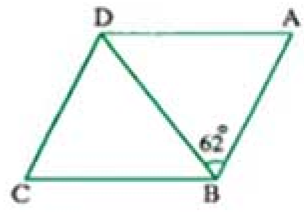
[b] In the opposite figure :

ABCD is a rhombus

, $\overline{BD}$ is a diagonal in it

, m (∠ ABD) = 62°

Find with proof : m (∠ A)



4 Giza Governorate

El-Haram Zone
Hefr El-Batn Language School British Academy

Answer the following questions :

1 Choose the correct answer :

1 The measure of each angle of the regular pentagon equals ....

(a) 100° (b) 120° (c) 108° (d) 110°

2 The sum of measures of accumulative angles at a point equals ....

(a) 90° (b) 100° (c) 360° (d) 180°

3 Any triangle has at least two .... angles.

(a) acute (b) obtuse (c) right (d) reflex

4 ABCD is a parallelogram in which m (∠ A) = 70° , then m (∠ B) = ...°

(a) 70 (b) 110 (c) 90 (d) 180

5 (– 4 , 5) is the image of (5 , 4) by rotation in the origin point with an angle of measure ....

(a) 90° (b) – 90° (c) 180° (d) 360°

6 The image of the point (– 2 , 2) by a translation of magnitude 3 units in the positive direction of y-axis is ....

(a) (– 1 , 2) (b) (– 2 , 5) (c) (– 1 , 5) (d) (1 , 5)

2 Complete the following :

1 The sum of measures of the interior angles of any triangle equals ....

2 Each two opposite angles of a parallelogram are ....

3 The length of the line segment joining the midpoint of two sides of a triangle is equal to .... the length of the third side.

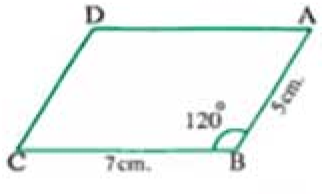
4 The image of the point (3 , – 5) by rotation 360° about the origin point is ....

5 The image of (– 3 , 0) by reflection in the y-axis is ....

3 **[a]** A regular hexagon of side length 15 cm.

Find : 1 its perimeter. 2 the measure of each angle.

[b] In the opposite figure :



ABCD is a parallelogram , $\overline{AB}$ = 5 cm.

, BC = 7 cm. , m (B) = 120°

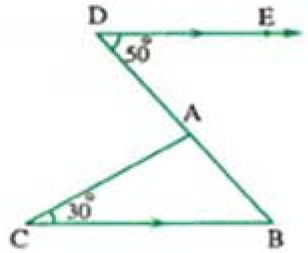
Find : m (∠ C) , m (∠ D) , the length of each of $\overline{AD}$ and $\overline{DC}$

4 **[a] In the opposite figure :**

$\overline{DE} \parallel \overline{BC}$, m (∠ D) = 50°

, m (∠ C) = 30°

Find : m (∠ B) and m (∠ BAC)



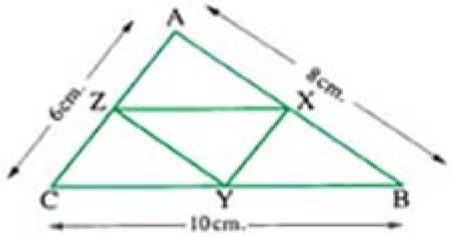
[b] In the opposite figure :

X , Y and Z

are the midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{AC}$ respectively

AB = 8 cm. , AC = 6 cm. , BC = 10 cm.

Find : The perimeter of Δ XYZ



5 **[a] In the opposite figure :**

m (∠ B) = 90° , AB = 7 cm.

BC = 24 cm.

Find : The length of $\overline{AC}$



[b] Draw ABC in which A (1 , 1) , B (5 , 1) and C (3 , 3) , then find its image by reflection in y-axis.

5 Giza Governorate

Experimental Schools
Math inspector

Answer the following questions :

1 **Complete the following :**

1. The image of the point (5 , – 3) under rotation of angle of measure 90° about the origin point is ....
2. The ray which is drawn from the midpoint of a side in a triangle parallel to another side .... the third side.
3. In the rhombus the two diagonals are ....
4. The sum of measures of the exterior angles of any convex polygon equals ....°
5. In Δ ABC , if m (∠ A) + m (∠ B) = m (∠ C) , then Δ ABC is ....

2 **Choose the correct answer :**

1. If the measure of an interior angle of a regular polygon is 135° , then the number of its sides is ....

   (a) 6 (b) 4 (c) 7 (d) 8

2 The image of the point (– 1 , 4) by the translation $(x , y) \longrightarrow (x + 3 , y - 2)$ followed by reflection in the x-axis is ....

(a) (2 , 2) (b) (– 2 , 2) (c) (– 2 , –2) (d) (2 , – 2)

3 ABCD is a parallelogram in which m (∠ A) + m (∠ C) = 110° , then m (∠ B) = ...

(a) 125° (b) 80° (c) 100° (d) 110°

4 The concave polygon should have .... angle.

(a) an acute (b) a right (c) an obtuse (d) a reflex

5 The image of the point .... is itself by reflection in y-axis.

(a) (0 , 3) (b) (3 , 0) (c) (3 , 3) (d) (– 3 , 3)

6 The identity rotation about the origin point with an angle of measure ....°

(a) 90 (b) 180 (c) 360 (d) – 90

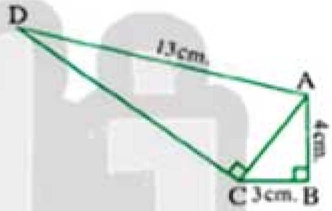
3 [a] **In the opposite figure :**

ABCD is a quadrilateral in which

m (∠ B) = m (∠ ACD) = 90°

, AB = 4 cm. , BC = 3 cm. and AD = 13 cm.

Find : AC and DC



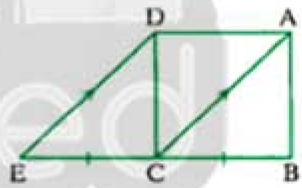
[b] **In the opposite figure :**

ABCD is a square , E ∈ $\overrightarrow{BC}$

such that BC = CE

1 **Prove that :** The figure ACED is a parallelogram.

2 **Find :** m (∠ E)



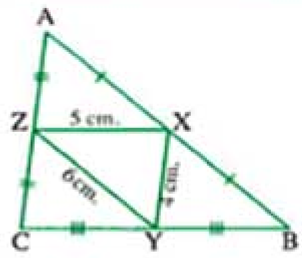
4 [a] **In the opposite figure :**

Δ ABC in which X , Y and Z are the midpoints of

$\overline{AB}$, $\overline{BC}$, $\overline{CA}$ respectively

, XZ = 5 cm. , XY = 4 cm. , YZ = 6 cm.

Find with proof : The perimeter of Δ ABC

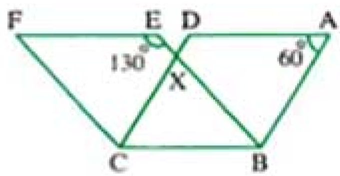


[b] **In the opposite figure :**

ABCD and EBCF are two parallelograms

, m (∠ BAD) = 60° , m (∠ BEF) = 130°

Find with proof : m (∠ BXC)

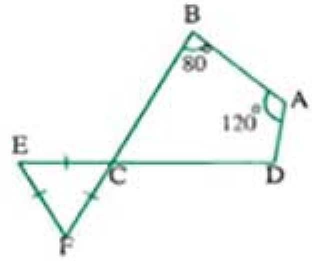


5 **[a] In the opposite figure :**

ABCD is a quadrilateral in which m (∠ A) = 120°

, m (∠ B) = 80° , Δ CEF is an equilateral triangle

Find : m (∠ D)



[b] Using the square lattice draw Δ ABC where :

A (2 , 4) , B (4 , 2) and C (3 , 1) , then map its image by the translation

$(x , y) \longrightarrow (x + 2 , y + 3)$

6 Alexandria Governorate

East Educational Zone
Math's Supervision (A)

Answer the following questions :

1 **Complete each of the following :**

1 The angle whose measure is 89° is .... angle.

2 The length of the line segment that joins two midpoints of two sides of a triangle equals ....

3 The area of one face of a cube is 25 cm^2 then its volume equals .... cm^3

4 The image of the point (2 , 1) by reflection in x-axis is ....

5 In the parallelogram XYZL , if m (∠ X) = $\frac{1}{2}$ m (∠ Y) , then m (∠ Y) = ...

2 **Choose the correct answer from those given :**

1 The supplementary of the angle whose measure is 30° is an angle of measure ....°

(a) 30 (b) 60 (c) 120 (d) 150

2 The number of the diagonals of a pentagon is ....

(a) 3 (b) 5 (c) 7 (d) 9

3 The image of the point (– 1 , 3) by translation (4 , – 2) is ....

(a) (3 , 1) (b) (3 , – 1) (c) (5 , 1) (d) (5 , – 5)

4 The sum of the measures of the interior angles of the triangle equals ....°

(a) 90 (b) 360 (c) 180 (d) 540

5 ABC is right-angled triangle at B , AB = 6 cm. , BC = 8 cm. , then AC = ... cm.

(a) 10 (b) 28 (c) 100 (d) 160

6 The measure of the exterior angle of the equilateral triangle is ....°

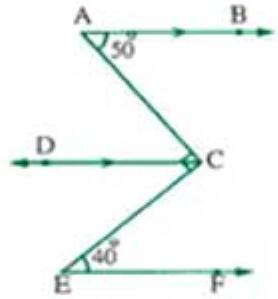
(a) 30 (b) 45 (c) 60 (d) 120

3 **[a] In the opposite figure :**

$\overrightarrow{AB} // \overrightarrow{CD}$, m (∠ A) = 50°

, ∠ ACE is right angle and m (∠ E) = 40°

Prove that : $\overrightarrow{AB} // \overrightarrow{EF}$



[b] Use the translation : $(x , y) \longrightarrow (x + 2 , y + 3)$ to locate the point whose image is (2 , 3)

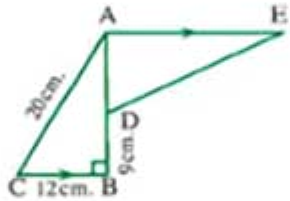
4 **[a] In the opposite figure :**

ABC is a triangle , m (∠ B) = 90°

, $\overline{AE} // \overline{BC}$, if BC = 12 cm. , AC = 20 cm.

, D ∈AB where BD = 9 cm. and AE = 2 BC

Find : The length of each of $\overline{AD}$, $\overline{ED}$



[b] Using square lattice , draw Δ ABC , where :

A (– 2 , 4) , B (5 , 0) , C (3 , – 3)

, then draw the reflected image of Δ ABC in the origin point.

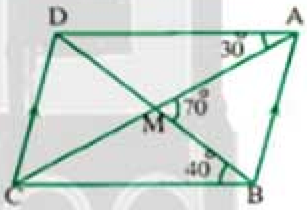
5 **[a] In the opposite figure :**

$\overline{AB} // \overline{DC}$, $\overline{AC} \cap \overline{BD} = \{M\}$

m (∠ DAC) = 30° , m (∠ DBC) = 40°

and m (∠ AMB) = 70°

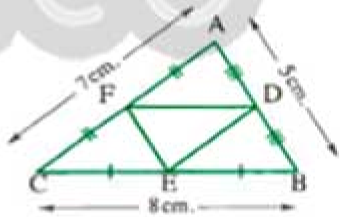
Prove that : ABCD is a parallelogram



[b] In the opposite figure :

AB = 5 cm. , BC = 8 cm. , AC = 7 cm. D , E and F are the midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{CA}$ respectively.

Calculate : The perimeter of Δ DEF



7 Alexandria Governorate

Middle Educational Zone
Math's Supervision

Answer the following questions :

1 **Complete each of the following :**

[1] The measure of the straight angle equals ....°

[2] The image of the point (4 , – 2) by reflection in x-axis is ....

3 The ray drawn from the midpoint of a side parallel to another side in a triangle ....

4 The image of the point (– 2 , 1) by rotation with an angle of measure 180° about origin point is ....

5 The length of line segment joining the midpoints of two sides of a triangle equals ....

6 A rhombus is a .... with two adjacent equal sides in length.

2 Choose the correct answer :

1 The perimeter of a square with side length 1 cm. equals .... cm.

(a) 5 (b) 1 (c) 4 (d) 2

2 The number of diagonals in a pentagon is ....

(a) 0 (b) 3 (c) 4 (d) 5

3 The edge length of a cube whose volume is 27 cm^3 is .... cm.

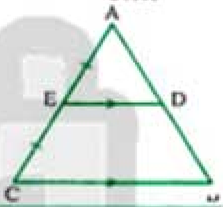
(a) 9 (b) 3 (c) 27 (d) 6

4 In Δ ABC , if m (∠ B) = 90° , AB = 3 cm. , BC = 4 cm. , then AC = ... cm.

(a) 7 (b) 12 (c) 1 (d) 5

5 In the opposite figure : CB : ED = ...

(a) 1 : 1 (b) 1 : 2 (c) 2 : 1 (d) 1 : 4

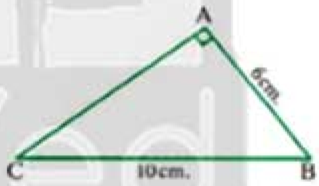


3 [a] In the opposite figure :

ABC is a right-angled triangle at A

, BC = 10 cm. , AB = 6 cm.

Find : The length of $\overline{AC}$

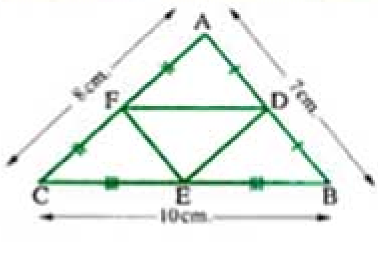


[b] Draw the image of the rectangle XYZL where X (– 5 , 1) , Y (– 5 , 4) , Z (– 1 , 4) , L (– 1 , 1) by reflection in the X-axis.

4 [a] In the opposite figure :

BC = 10 cm. , AB = 7 cm. , AC = 8 cm.

Calculate : The perimeter of the Δ FDE



[b] The ratio between the measures of the angles of a quadrilateral is 2 : 2 : 3 : 5

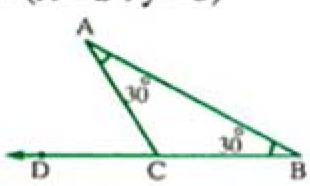
Calculate : The measure of the biggest angle.

5 [a] Find the image of the point A (5 , – 5) by translation (X , y) ⟶ (X – 2 , y – 3)

[b] In the opposite figure :

m (∠ A) = m (∠ B) = 30°

Find showing steps : m (∠ ACD)



8 El-Kalyoubia Governorate

Directorate of Education
Central Maths Supervision

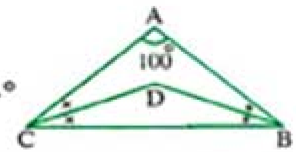
Answer the following questions :

1 Choose the correct answer :

1. If the perimeter of a square is 20 cm. , then the length of its side is .... cm.
   (a) 3 (b) 5 (c) 7 (d) 9
2. The number of diagonals of a pentagon is ....
   (a) 3 (b) 5 (c) 7 (d) 9
3. If ABCD is a parallelogram , m (∠ A) + m (∠ C) = 140° , then m (∠ D) = ...
   (a) 40° (b) 70° (c) 180° (d) 110°
4. The image of the point (– 3 , 5) by rotation about the origin point by an angle of measure 90° is ....
   (a) (– 3 , 5) (b) (5 , – 3) (c) (– 5 , – 3) (d) (3 , – 5)
5. The measure of the exterior angle of the equilateral triangle is ....
   (a) 30° (b) 45° (c) 60° (d) 120°
6. If ABC is a right-angled triangle at B , AB = 6 cm. and BC = 8 cm. , then AC = ...
   (a) 5 cm. (b) 10 cm. (c) 15 cm. (d) 20 cm.

2 Complete :

1. The number of axis of symmetry of a rectangle equals ....
2. The volume of a cube of edge length 0.2 m. equals .... cm^3.
3. The image of (3 , – 2) by reflection in the y-axis is ....
4. In the opposite figure : m (∠ BDC) = ...°
5. The measure of each interior angle of a regular hexagon is ....°



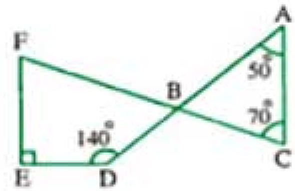
3 [a] In the opposite figure :

$\overline{AD} \cap \overline{FC} = \{B\}$

, m (∠ A) = 50° , m (∠ C) = 70°

, m (∠ D) = 140° , $\overline{EF} \perp \overline{ED}$

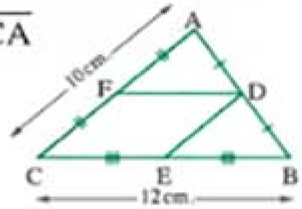
Find : m (∠ F)



[b] In the opposite figure :

ABC is a triangle , D , E , F are the midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CA}$ respectively , BC = 12 cm. , AC = 10 cm.

Find : The perimeter of the quadrilateral DECF

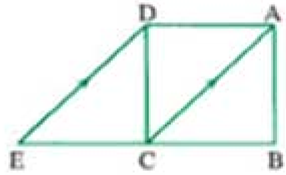


4 **[a] In the opposite figure :**

ABCD is a square , E ∈ $\overrightarrow{BC}$ and $\overline{AC}$ // $\overline{DE}$

1 **Prove that :** ACED is a parallelogram.

2 **Find :** m (∠ ACE)



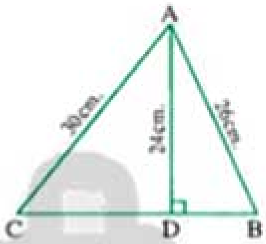
[b] In the opposite figure :

m (∠ ADB) = 90° , AD = 24 cm.

, AB = 26 cm. , AC = 30 cm.

Find : 1 The length of $\overline{BC}$

2 The area of Δ ABC



5 **[a]** Using square lattice , draw $\overline{AB}$ where A (4 , 3) , B (– 1 , 1) , then find the image of $\overline{AB}$ by translation $(x , y) \longrightarrow (x + 2 , y - 1)$

[b] Draw the image of the triangle ABC where A (1 , 1) , B (3 , 4) , C (5 , 2) by reflection in x-axis.

9 El-Gharbia Governorate

Official Language Schools
The Central Maths Supervision

Answer the following questions :

1 **Choose the correct answer :**

1 The measure of the exterior angle of the equilateral triangle equals ....°

(a) 30 (b) 45 (c) 60 (d) 120

2 If the image of the point (5 , – 3) by rotation around the origin point is itself , then the measure of the rotation angle equals ....°

(a) 90 (b) 270 (c) 180 (d) 360

3 The image of a square by rotation around the origin point with an angle of measure 90° is a ....

(a) rectangle (b) square (c) rhombus (d) trapezium

4 Any triangle has at least .... acute angle.

(a) 0 (b) 1 (c) 2 (d) 3

5 The measure of the interior angle of the regular hexagon equals ....°

(a) 60 (b) 108 (c) 120 (d) 135

6 The image of the point (– 5 , 0) by reflection on X-axis is ....

(a) (5 , 0) (b) (0 , 5) (c) (– 5 , 0) (d) (0 , – 5)

2 Complete :

1 The line segment joining the midpoints of two sides of a triangle is ....

2 If ABCD is a parallelogram in which m (∠ A) = 60° , then m (∠ B) = ...°

3 The image of the point (3 , 2) by reflection in the origin point is ....

4 Each two opposite angles in a parallelogram are ....

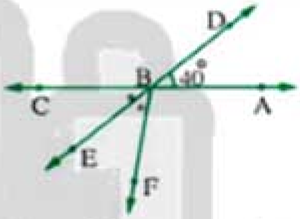
5 The rectangle is a parallelogram in which one of its angles is ....

3 [a] In the opposite figure :

$\overleftrightarrow{AC} \cap \overleftrightarrow{DE} = \{B\}$, m (∠ ABD) = 40°

and $\overrightarrow{BE}$ bisects ∠ CBF

Find with proof : m (∠ ABF)

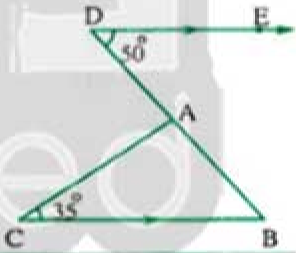


[b] In the opposite figure :

$\overrightarrow{DE}$ // $\overrightarrow{CB}$, m (∠ D) = 50° , m (∠ C) = 35°

Find with proof :

m (∠ B) , m (∠ BAC)

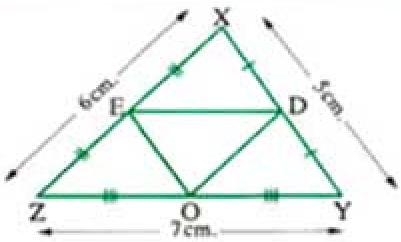


4 [a] In the opposite figure :

XYZ is a triangle in which XY = 5 cm.

, XZ = 6 cm. , YZ = 7 cm.

Find with proof : The perimeter of Δ DOE



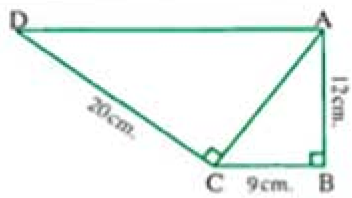
[b] On the square lattice , draw the triangle whose vertices are A (4 , 4) , B (4 , 2) , C (1 , 2) , then find its image by the translation (– 4 , – 2)

5 [a] In the opposite figure :

m (∠ B) = m (∠ ACD) = 90°

, AB = 12 cm. , BC = 9 cm. , CD = 20 cm.

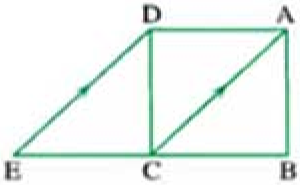
Find : The length of $\overline{AD}$



[b] In the opposite figure :

ABCD is a square , $E \in \overrightarrow{BC}$, $\overline{AC} \parallel \overline{DE}$

Prove that : ACED is a parallelogram.



10 El-Dakahlia Governorate

Directorate of Education
Maths Supervision

Answer the following questions :

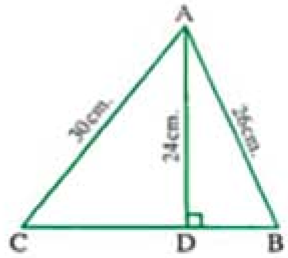
1 Choose the correct answer :

1. The sum of the measures of an exterior angles of a triangle equals ....
   (a) 90° (b) 180° (c) 270° (d) 360°
2. The side length of a rhombus whose perimeter 36 cm. equals ....
   (a) 144 cm. (b) 6 cm. (c) 9 cm. (d) 18 cm.
3. The measure of each angle of regular octagon equals ....
   (a) 60° (b) 108° (c) 120° (d) 135°
4. The parallelogram whose diagonals are not perpendicular but equal in length is called ....
   (a) rhombus (b) square (c) rectangle (d) trapezium
5. The image of the point (– 3 , 5) by rotation about the origin point with an angle of measure – 270° is ....
   (a) (5 , 3) (b) (– 5 , 3) (c) (3 , 5) (d) (– 5 , – 3)
6. The number of the acute angles in any triangle equals at least ....
   (a) zero (b) 1 (c) 2 (d) 3

2 Complete each of the following :

1. The measure of any of the exterior angles of an equilateral triangle equals ....
2. If Δ ABC is right-angled triangle at B , m (∠ C) = 55° , then m (∠ A) = ... °
3. The parallelogram whose perimeter 32 cm. and the length of one of its sides is 7 cm. , then the length of its adjacent side equals ....
4. If the image of the point (– 5 , 4) by a translation is (1 , 4) , then the image of the point (3 , – 6) by the same translation is ....
5. The rectangle is a parallelogram in which one of its angles is ....

3 **[a] In the opposite figure :**



ABC is a triangle in which D ∈ $\overline{BC}$

, m (∠ ADB) = 90° , AB = 26 cm.

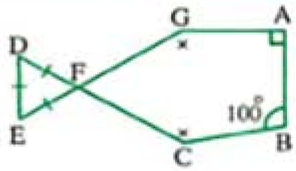
, AD = 24 cm. , AC = 30 cm.

Find : 1 The length of $\overline{BC}$

2 The area of the triangle ABC

[b] Draw the image of triangle ABC where A (2 , 2) , B (5 , 2) , C (3 , 5) by reflection in y-axis.

4 **[a] In the opposite figure :**

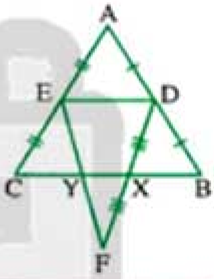


DFE is an equilateral triangle

, m (∠ A) = 90° , m (∠ B) = 100° , m (∠ C) = m (∠ G)

Find : m (∠ C)

[b] In the opposite figure :

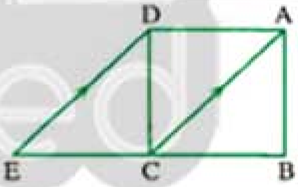


ABC is a triangle in which D , E are the midpoints of $\overline{AB}$, $\overline{AC}$ respectively

, CB = 12 cm. and DX = XF

Find : The length of $\overline{XY}$

5 **[a] In the opposite figure :**



ABCD is a square , E ∈ $\overrightarrow{BC}$, $\overrightarrow{AC}$ // $\overrightarrow{DE}$

Prove that : ACED is a parallelogram **, then find :** m (∠ ACE)

[b] Draw Δ OBC on a square lattice where O (0 , 0) , B (4 , 0) , C (0 , 3) , then find its image by rotation about the origin point with an angle of measure 180°

11 Suez Governorate

Directorate of Education
Math Supervision

Answer the following questions :

1 **Choose the correct answer :**

1 The two diagonals are equal in length and not perpendicular in a ....

(a) parallelogram (b) rectangle (c) square (d) rhombus

2 The image of (1 , 3) by translation (4 , 2) is ....

(a) (3 , 1) (b) (5 , 5) (c) (5 , 1) (d) (5 , – 5)

3 The measure of an exterior angle in an equilateral triangle is ....

(a) 30° (b) 45° (c) 60° (d) 120°

4 In a parallelogram if the two adjacent sides are equal in length , then the shape is a ....

(a) square (b) rhombus (c) rectangle (d) trapezium

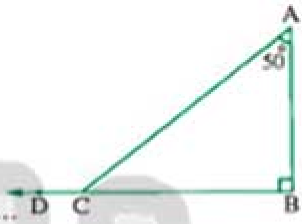
5 The number of axes of symmetry of the equilateral triangle is ....

(a) 0 (b) 1 (c) 2 (d) 3

6 The sum of measures of the interior angles in a triangle is ....°

(a) 90 (b) 360 (c) 180 (d) 540

2 Complete :



1 In the opposite figure : m (∠ ACD) = ...°

2 The ray drawn from the midpoint of one side of a triangle parallel to another side ....

3 The image of the point (1 , – 2) by reflection in X-axis is ....

4 The sum of measures of the interior angles of the pentagon is ....°

5 If ABCD is a rhombus , then .... ⊥ ....

3 [a] In the opposite figure :

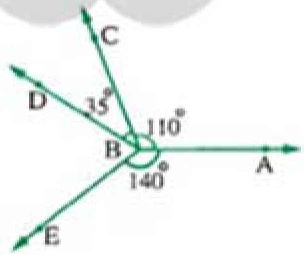


B ∈ $\overleftrightarrow{AC}$, m (∠ CBE) = 116°

, $\overrightarrow{BD}$ bisects ∠ ABE

Find : m (∠ ABD)

[b] In the opposite figure :

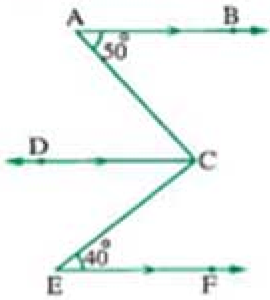


m (∠ ABC) = 110° , m (∠ CBD) = 35°

, m (∠ ABE) = 140°

Find : m (∠ DBE)

4 [a] In the opposite figure :



$\overrightarrow{AB}$ // $\overrightarrow{CD}$ // $\overrightarrow{EF}$

, m (∠ A) = 50° , m (∠ E) = 40°

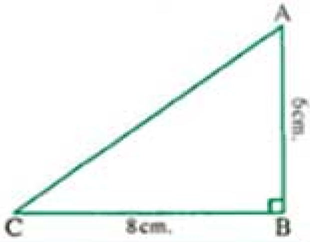
Find by proof : m (∠ ACE)

[b] In the opposite figure :

Δ ABC is right-angled at B

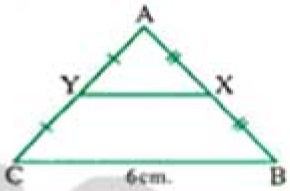
, AB = 6 cm. , BC = 8 cm.

Find : The length of $\overline{AC}$



5 [a] Complete :

1. The image of (3 , 2) by rotation about the origin point with an angle of measure 90° is ....
2. The image of (3 , 2) by reflection in the origin point is ....
3. The image of (3 , 2) by rotation about the origin point with an angle of measure 180° is ....
4. In the opposite figure :
   XY = ... cm.

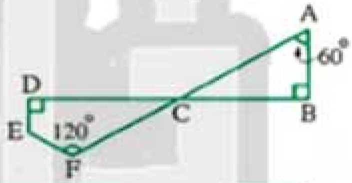


[b] In the opposite figure :

$\overline{AB}$, $\overline{DE}$ are perpendicular to $\overline{BD}$

, $\overline{BD} \cap \overline{AF} = \{C\}$, m ($\angle$ A) = 60° , m ($\angle$ CFE) = 120°

Find with proof : m ($\angle$ E)



12 Port Said Governorate

East Educational Zone
Math's Supervision

Answer the following questions :

1 Choose the correct answer :

1. The image of the point (2 , – 5) by reflection in x-axis is ....
   (a) (2 , – 5) (b) (2 , 5) (c) (– 2 , – 5) (d) (5 , 2)
2. The measure of each interior angle of a regular hexagon equals ....
   (a) 60° (b) 108° (c) 120° (d) 135°
3. The two diagonals are equal in length and not perpendicular in the ....
   (a) parallelogram. (b) rectangle. (c) rhombus. (d) square.
4. The sum of the measures of the interior angles of a triangle equals ....
   (a) 90° (b) 180° (c) 270° (d) 360°
5. The image of the point (3 , – 2) by reflection in the y-axis is the point ....
   (a) (3 , 2) (b) (– 3 , – 2) (c) (– 3 , 2) (d) (– 2 , 3)
6. The measure of the exterior angle of the equilateral triangle is ....
   (a) 30° (b) 45° (c) 60° (d) 120°

2 Complete each of the following :

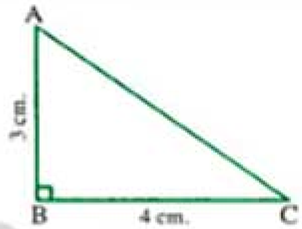
1. The length of the line segment that joins two midpoints of two sides of a triangle equals .... the length of the third side.
2. The image of the point A (– 3 , 2) by reflection in the origin point is the point ....
3. The sum of the measures of the angles of a quadrilateral equals ....°
4. If ABCD is a parallelogram in which m (∠ A) = 60° , then m (∠ B) = ...°
5. The length of the side of a rhombus whose perimeter is 24 cm. equals .... cm.

3 **[a] In the opposite figure :**

ABC is a right-angled triangle at B

, AB = 3 cm. , BC = 4 cm.

Find : The length of $\overline{AC}$



[b] On the lattice , find the image of the triangle LMN where L (– 4 , – 1) , M (– 1 , – 3) , N (0 , – 1) by reflection in the X-axis.

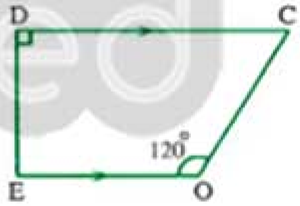
4 **[a]** Using the square lattice , draw $\overline{AB}$ where A (4 , 3) , B (– 1 , 1) , then find the image of $\overline{AB}$ by reflection in the origin point.

[b] In the opposite figure :

$\overline{DC}$ // $\overline{EO}$, m (∠ D) = 90°

, m (∠ O) = 120°

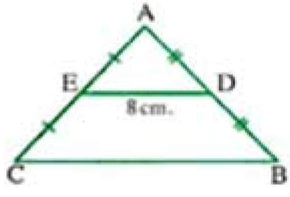
Find : m (∠ C)



5 **[a] In the opposite figure :**

ABC is a triangle in which ED = 8 cm.

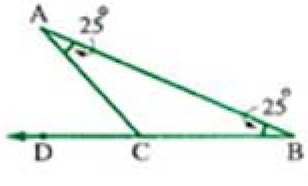
Find : The length of $\overline{CB}$



[b] In the opposite figure :

m (∠ A) = m (∠ B) = 25°

Find : m (∠ ACD)



13 Kafr El-Sheikh Governorate

General Math Supervision

Answer the following questions :

1 Choose the correct answer :

1. The sum of measures of the interior angles of a hexagon equals ....°
   (a) 180 (b) 540 (c) 720 (d) 360
2. The two diagonals are equal in length and perpendicular in the ....
   (a) trapezium. (b) square. (c) rectangle. (d) parallelogram.
3. In Δ XYZ , if m (∠ X) > m (∠ Y) + m (∠ Z) , then ∠ X is .... angle.
   (a) an acute (b) an obtuse (c) a right (d) a straight
4. The image of (3 , – 5) by rotation R (O , 90°) is ....
   (a) (– 3 , 5) (b) (– 3 , – 5) (c) (5 , 3) (d) (5 , – 3)
5. The sum of the measures of the exterior angles of a triangle equals ....°
   (a) 60 (b) 120 (c) 270 (d) 360
6. The measure of the exterior angle of the equilateral triangle is ....°
   (a) 90 (b) 120 (c) 360 (d) 60

2 Complete :

1. The image of A (– 2 , 3) by translation (X + 3 , y – 2) is ....
2. The rhombus with a right angle is ....
3. The image of (– 1 , 2) by reflection in the origin point is ....
4. The length of the line segment joining two midpoints of two sides of a triangle is equal to .... the length of the third side.
5. If ABCD is a parallelogram in which BC = 8 cm. and CD = 6 cm. , then its perimeter = ... cm.

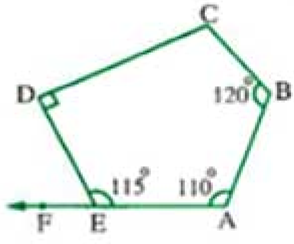
3 [a] In the opposite figure :

ABCDE is a pentagon in which $F \in \overrightarrow{AE}$

, m (∠ A) = 110° , m (∠ B) = 120° , m (∠ DEA) = 115°

, m (∠ D) = 90°

Find with proof : m (∠ C)

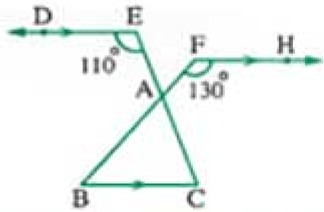


[b] In the opposite figure :

$\overrightarrow{ED} \parallel \overrightarrow{BC} \parallel \overrightarrow{FH}$

, m (∠ E) = 110° , m (∠ F) = 130°

Find with proof : m (∠ BAC)



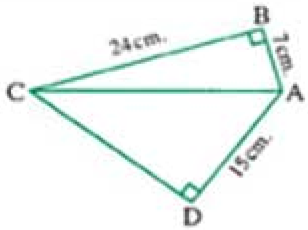
4 **[a] In the opposite figure :**

ABCD is a quadrilateral in which

m (∠ B) = m (∠ D) = 90°

, AB = 7 cm. , BC = 24 cm. and AD = 15 cm.

Find : The length of each of $\overline{AC}$ and $\overline{DC}$

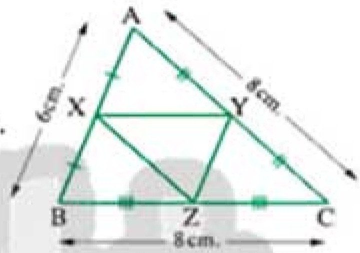


[b] In the opposite figure :

AB = 6 cm. , BC = 8 cm. , AC = 8 cm.

, X , Y , Z are the midpoints of $\overline{AB}$, $\overline{AC}$ and $\overline{BC}$ respectively.

Find with proof : The perimeter of Δ XYZ



5 **[a]** On a square lattice , draw Δ ABC , where A (2 , 4) , B (2 , 1) and C (6 , 1)

, then draw its image by :

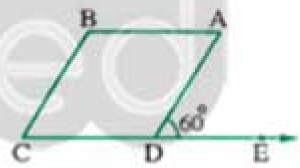
1 reflection in the y-axis. 2 rotation (O , 180°)

[b] In the opposite figure :

ABCD is a parallelogram , E ∈ $\overrightarrow{CD}$

, m (∠ ADE) = 60°

Find with proof : m (∠ B)



14 Beni Suef Governorate

Directorate of official Language Schools
Education Administration

Answer the following questions :

1 **Choose the correct answer :**

1 The measure of the interior angle of a regular polygon of n sides equals ....

(a) $\frac{(n-2) \times 90°}{n}$ (b) $\frac{(n-2) \times 180°}{2}$ (c) $\frac{(n-2) \times 180°}{n}$ (d) 180° × (n – 1)

2 In Δ XYZ , if m (∠ X) = 50° , m (∠ Y) = 100° , then m (∠ Z) = ...

(a) 30° (b) 50° (c) 80° (d) 100°

3 The measure of the exterior angle of the equilateral triangle at any one of its vertices equals ....

(a) 30° (b) 60° (c) 120° (d) 150°

4 If the point À (– 4 , 5) is the image of the point A by translation (– 2 , 3) , then the point A is ....

(a) (– 6 , 8) (b) (– 2 , 8) (c) (– 2 , 2) (d) (– 6 , 2)

5 The angle whose measure is 179° , its type is ....

(a) acute (b) right (c) obtuse (d) straight

6 If Δ ABC ≡ Δ XYZ , then ....

(a) AB = YZ (b) BC = XZ (c) YX = CA (d) ZY = CB

2 Complete :

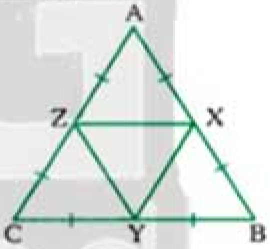
1 The parallelogram whose two diagonals are .... is called a rectangle.

2 The ray drawn from the midpoint of a side of a triangle parallel to another side ....

3 In the right-angled triangle , the area of the square drawn on the hypotenuse equals ....

4 **In the opposite figure :**

Δ ABC is an equilateral triangle in which X , Y and Z are the midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{AC}$ respectively , then the image of Δ XBY by a translation of magnitude XZ in the direction of $\overrightarrow{XZ}$ is ....



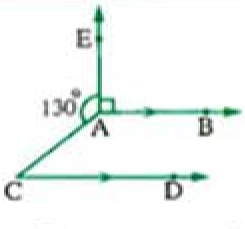
5 If a straight line intersects two parallel straight lines , then every two corresponding angles are ....

3 [a] In the opposite figure :

$\overrightarrow{AB}$ // $\overrightarrow{CD}$, m (∠ EAC) = 130°

and m (∠ EAB) = 90°

Find each of : m (∠ BAC) and m (∠ C)

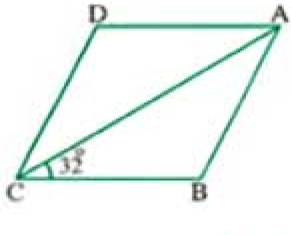


[b] In the opposite figure :

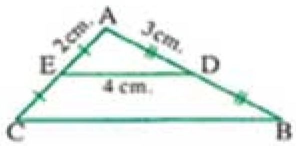
ABCD is a rhombus

, $\overline{AC}$ is a diagonal in it , m (∠ ACB) = 32°

Find : m (∠ D)



4 **[a] In the opposite figure :**

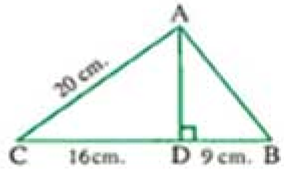


D and E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively

, AD = 3 cm. , AE = 2 cm. and DE = 4 cm.

Find : The perimeter of the figure DBCE

[b] In the opposite figure :



$\overline{AD} \perp \overline{BC}$, BD = 9 cm.

, DC = 16 cm. and AC = 20 cm.

Find : The length of each of $\overline{AD}$ and $\overline{AB}$

5 On a square lattice , draw Δ ABC where

A (– 6 , – 1) , B (– 2 , – 1) and C (– 5 , – 6) , then draw :

1. The image of Δ ABC by reflection in the X-axis.
2. The image of Δ ABC by rotation about the origin point with an angle of measure (– 180°)

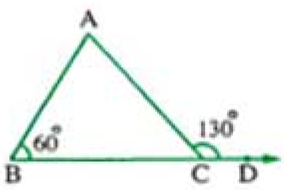
15 Souhag Governorate

Math Supervision

Answer the following questions :

1 **Choose the correct answer from those given :**

1. The sum of the measures of the interior angles of a pentagon equals .... °
   (a) 108 (b) 180 (c) 540 (d) 720
2. In the .... the two diagonals are perpendicular and not equal in length.
   (a) square (b) rectangle (c) rhombus (d) parallelogram
3. The image of the point (– 2 , 3) by reflection in the y-axis is the point ....
   (a) (3 , 2) (b) (– 3 , 2) (c) (2 , 3) (d) (– 3 , – 2)
4. **In the opposite figure :**

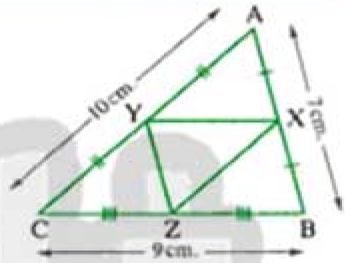
   

   m (∠ A) = ...
   (a) 40° (b) 50°
   (c) 60° (d) 70°
5. The image of the point (– 1 , 3) by translation (4 , – 2) is ....
   (a) (3 , 1) (b) (3 , – 1) (c) (5 , 1) (d) (5 , – 5)
6. In the triangle ABC , if m (∠ A) = 50° , m (∠ B) = 100° , then m (∠ C) = ...
   (a) 30° (b) 180° (c) 32° (d) 23°

2 Complete each of the following :

1. The length of the line segment joining the midpoints of two sides of a triangle is .... and ....
2. If Δ XYZ is a right-angled triangle at X , XY = 12 cm. and XZ = 9 cm. , then YZ = ... cm.
3. The image of the point (– 1 , 2) by rotation about the origin point with an angle of measure 90° is ....
4. If Δ ABC ≡ Δ XYZ , then m ($\angle$ B) = m ($\angle$ ....)
5. The ray drawn from the midpoint of a side of a triangle parallel to another side ....

3 [a] In the opposite figure :

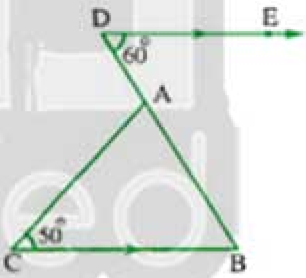


X , Y , Z are the midpoints of $\overline{AB}$, $\overline{AC}$, $\overline{BC}$ respectively , AB = 7 cm.

, BC = 9 cm. , AC = 10 cm.

Find : The perimeter of Δ XYZ

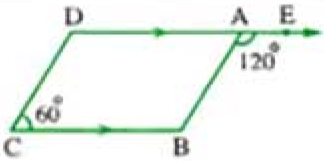
[b] In the opposite figure :



$\overline{DE}$ // $\overline{CB}$, m ($\angle$ D) = 60° , m ($\angle$ C) = 50°

Find : m ($\angle$ DAC)

4 [a] In the opposite figure :

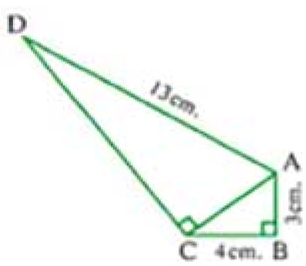


$\overrightarrow{DA}$ // $\overline{BC}$, m ($\angle$ DCB) = 60°

, m ($\angle$ EAB) = 120°

Prove that : ABCD is a parallelogram.

[b] In the opposite figure :



m ($\angle$ B) = m ($\angle$ ACD) = 90°

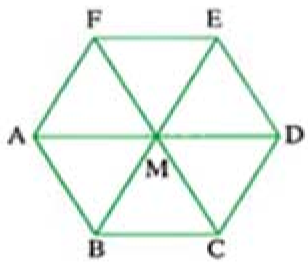
, AB = 3 cm. , BC = 4 cm.

and AD = 13 cm.

Find : The length of each of $\overline{AC}$, $\overline{CD}$

5 [a] On the square lattice draw ΔABC , where A (1 , 2) , B (4 , 2) , C (4 , – 1) , then find its image by rotation about the origin point with an angle of measure 180°

[b] **In the opposite figure :**



ABCDEF is a regular hexagon

Find the image of ΔABM by :

1 reflection in $\overleftrightarrow{EB}$

2 translation FE in direction of $\overrightarrow{FE}$

3 rotation (M , 120°)

4 reflection in M

Final Examinations

on Geometry and Measurement



Model 1

Answer the following questions :

1 Choose the correct answer from those given :

1 Circumference of a circle of radius 7 cm. = ... cm. $\left(\pi = \frac{22}{7}\right)$

(a) 11 (b) 22 (c) 44 (d) 88

2 The image of the point (– 1 , 3) by translation (4 , – 2) is ....

(a) (3 , 1) (b) (3 , – 1) (c) (5 , 1) (d) (5 , – 5)

3 The measure of the exterior angle of the equilateral triangle is ....

(a) 30° (b) 45° (c) 60° (d) 120°

4 In a parallelogram if the adjacent sides are equal in the length , then the shape is ....

(a) square. (b) rhombus. (c) rectangle. (d) trapezium.

5 The number of the diagonals of a pentagon is ....

(a) 3 (b) 5 (c) 7 (d) 9

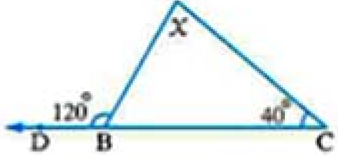
6 The number of axes of symmetry of an isosceles triangle = ...

(a) zero (b) 1 (c) 2 (d) 3

2 Complete the following :

1 The image of the point (2 , 1) by reflection in X-axis is ....

2 **In the opposite figure :**



X = ...°

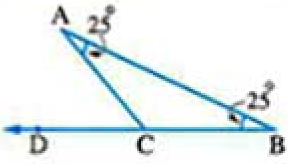
3 XYZ is a triangle in which m (∠ Y) = 90° , XY = 3 cm.

, XZ = 5 cm. , then YZ = ... cm.

4 ABCD is a parallelogram in which m (∠ A) = 100° , then m (∠ B) + m (∠ D) = ...°

5 The sum of the measures of the interior angles of a triangle = ...°

3 [a] In the opposite figure :

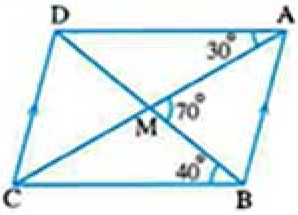


m (∠ A) = m (∠ B) = 25°

Find : m (∠ ACD)

[b] Draw a triangle ABC in which AB = 5 cm. , AC = 3 cm. and m (∠ A) = 40°
, then draw $\grave{C}$ is the image of C under rotation R (A , 40°) , $\grave{B}$ is the image of B under rotation R (A , – 40°)

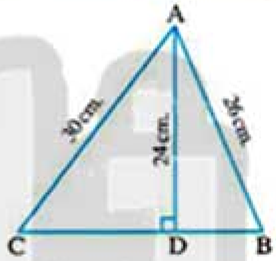
4 [a] In the opposite figure :



$\overline{AB} \parallel \overline{DC}$, $\overline{AC} \cap \overline{BD} = \{M\}$,
m (∠ DAC) = 30° , m (∠ DBC) = 40°
and m (∠ AMB) = 70°
Prove that : ABCD is a parallelogram.

[b] Use the translation : $(x , y) \longrightarrow (x + 2 , y + 3)$
to find the point whose image is (2 , 3)

5 [a] In the opposite figure :

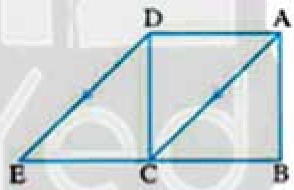


$\overline{AD} \perp \overline{BC}$, if AD = 24 cm. , AB = 26 cm. , AC = 30 cm.

1 **Find :** The length of $\overline{BC}$

2 **Find :** The area of Δ ABC

[b] In the opposite figure :



ABCD is a square , E ∈ $\overrightarrow{BC}$, $\overline{AC} \parallel \overline{DE}$
Prove that : ACED is a parallelogram.

Model 2

Answer the following questions :

1 **Choose the correct answer from those given :**

1 ABC is a right-angled triangle at B , AB = 6 cm. , BC = 8 cm. , then AC = ... cm.

(a) 10 (b) 28 (c) 100 (d) 160

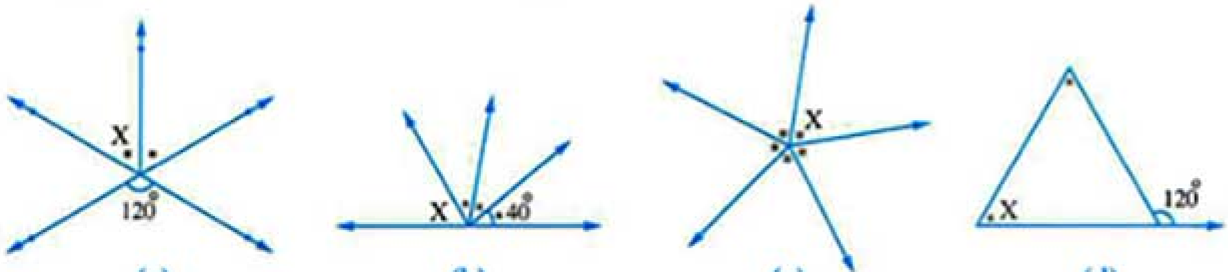
2 The measure of each angle of regular hexagon equals ....

(a) 60° (b) 108° (c) 120° (d) 135°

3 The two diagonals are equal in length and not perpendicular in ....

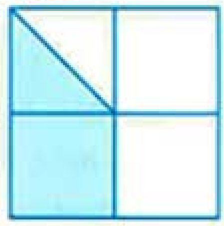
(a) parallelogram. (b) rectangle. (c) rhombus. (d) square.

4 In all the following shapes m (∠ X) = 60° except the shape ....



(a) (b) (c) (d)

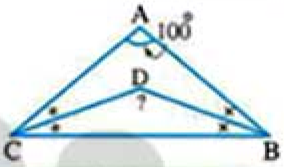
5 **In the opposite figure :**



The area of the shaded part from the area of all shape equals ....

(a) $\frac{1}{8}$ (b) $\frac{1}{4}$ (c) $\frac{3}{8}$ (d) $\frac{3}{4}$

6 **In the opposite figure :**

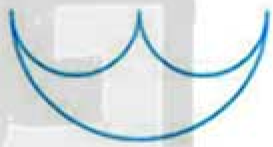


m (∠ BDC) = ...°

(a) 60 (b) 80 (c) 100 (d) 140

2 Complete the following :

1 **In the opposite figure :**



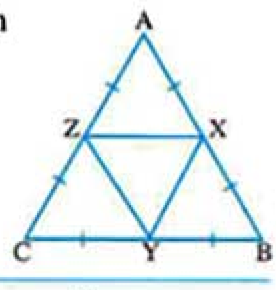
Semicircle of diameter 14 cm. and two semicircles the diameter of each is 7 cm.
, then the perimeter of the figure equals .... cm. $\left(\pi = \frac{22}{7}\right)$

2 The image of the point (2 , 3) by translation MN , in direction $\overline{MN}$, where M (2 , – 1) , N (5 , 1) is ....

3 The volume of a cube of side length 1.2 m. = ... cm^3.

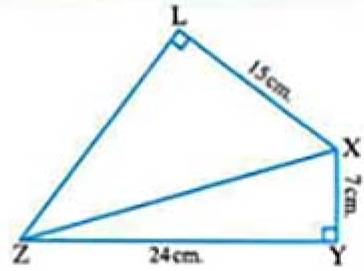
4 The ray drawn parallel to one side of a triangle and passing through the midpoint of another side ....

5 **In the opposite figure :**



The image of the triangle XBY by translation XZ in direction $\overrightarrow{XZ}$ is ....

3 [a] In the opposite figure :

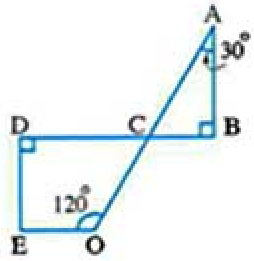


XYZL is a quadrilateral in which
m (∠ Y) = m (∠ L) = 90° , XY = 7 cm. ,
YZ = 24 cm. , XL = 15 cm.
Find : The length of each of $\overline{XZ}$ and $\overline{LZ}$

[b] Using the square lattice , draw $\overline{AB}$ where A (4 , 3) , B (– 1 , 1)
then find the image of $\overline{AB}$ by translation $(x , y) \longrightarrow (x + 2 , y - 1)$

4 [a] Draw the image of triangle ABC where A (1 , 1) , B (3 , 4) , C (5 , 2) by reflection in x-axis.

[b] **In the opposite figure :**



$\overline{AB}$ and $\overline{ED}$ are perpendicular to $\overline{BD}$

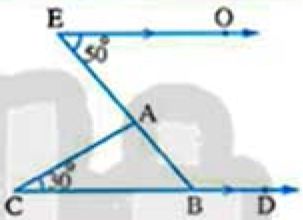
, $\overline{BD} \cap \overline{AO} = \{C\}$,

m (∠ A) = 30°

, m (∠ EOC) = 120° ,

Find : m (∠ E)

5 [a] **In the opposite figure :**

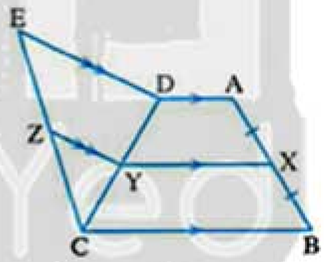


$\overrightarrow{EO} \parallel \overrightarrow{CD}$, m (∠ E) = 50°

, m (∠ C) = 30° ,

Find the measures of angles of Δ ABC , m (∠ ABD)

[b] **In the opposite figure :**



X is the midpoint of $\overline{AB}$

, Y ∈ $\overline{CD}$, Z ∈ $\overline{CE}$

, $\overline{AD} \parallel \overline{XY} \parallel \overline{BC}$, $\overline{YZ} \parallel \overline{DE}$

Is CZ = ZE ? giving reason

Model examination for the merge students

Answer the following questions :

1 Choose the correct answer :

1 The sum of the measures of the interior angles of a triangle = ...°

(a) 90 (b) 360 (c) 180 (d) 540

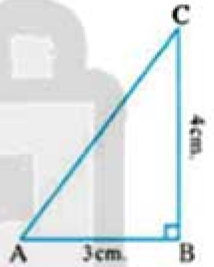
2 The image of the point (3 , – 2) by reflection in the y-axis is the point ....

(a) (3 , 2) (b) (– 3 , – 2) (c) (– 3 , 2) (d) (– 2 , 3)

3 The diagonals are equal and perpendicular in ....

(a) rhombus. (b) square. (c) recangle. (d) parallelogram.

4 **In the opposite figure :**

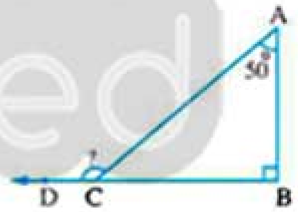


AC = ... cm.

(a) 5 (b) 7

(c) 25 (d) 625

5 **In the opposite figure :**



m (∠ ACD) = ...°

(a) 40 (b) 140

(c) 90 (d) 50

2 Complete each of the following :

1 The length of the line segment that joins two midpoints of two sides of a triangle equals .... the length of the third side.

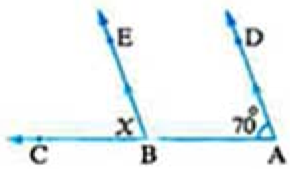
2 The rectangle is a parallelogram in which one of it's angles is ....

3 The length of the side of a rhombus whose perimeter is 24 cm. equals .... cm.

4 The image of the point A (– 3 , 2) by reflection in the origin point is the point À (.............. , ...)

5 **In the opposite figure :**

$x =$ ....°



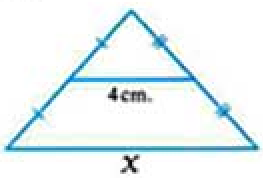
3 Put (✓) or (✗) :

1. The image of the point (4 , 3) by reflection in the x-axis is the point (3 , – 4) ( )
2. If ABC is a right-angled triangle at B , then $(AB)^2 = (BC)^2 + (AC)^2$ ( )
3. The pentagon has 5 diagonals. ( )
4. ABCD is a parallelogram , in which m (∠ A) = 70° , then m (∠ C) = 110° ( )
5. Any triangle contains at least two acute angles. ( )

4 Join from the column (A) to the suitable in the column (B) :

Column (A)	Column (B)
1 The sum of the measures of the interior angles of a quadrilateral = ...	• 120°
2 The measure of each angle of a regular hexagon = ...	• 360°
3 The image of the point (3 , 2) by translation (1 , – 2) is the point	• (– 1 , – 3)
4 The image of the point (1 , 3) by rotation about the origin point , of angle of measure 180° is the point (.............. , ...)	• 45
5 The diagonal of the square divides the angle of the vertex into two angles , the measure of each = ...°	• (4 , 0)

5 Find the value of x :



$x =$ .... cm.

Fig. (1)



$x =$ ....°

Fig. (2)

Schools Examinations on Geometry and Measurement

1 Cairo Governorate

Hadayek El Koba Educational Zone

Answer the following questions : (Calculators are Permitted)

1 Choose the correct answer :

1. The measure of the interior angle of the regular octagon equals ....
   (a) 1080° (b) 180° (c) 135° (d) 108°
2. If ABCD is a parallelogram in which m (∠ A) + m (∠ C) = 140° , then m (∠ B) = ...
   (a) 40° (b) 110° (c) 70° (d) 60°
3. In Δ ABC , if m (∠ B) = 90° , AB = 20 cm. , AC = 25 cm. , then BC = ... cm.
   (a) 625 (b) 12 (c) 15 (d) 225
4. If the perimeter of a square is 20 cm. , then its area equals .... cm^2.
   (a) 25 (b) 100 (c) 5 (d) 16
5. The image of the point (– 3 , 5) by rotation about the origin point with an angle of measure 90° is ....
   (a) (– 5 , 3) (b) (– 5 , – 3) (c) (5 , 3) (d) (3 , – 5)
6. The image of the point (– 1 , 3) by translation (4 , – 2) is ....
   (a) (3 , 1) (b) (3 , – 1) (c) (5 , 1) (d) (5 , – 5)

2 Complete the following :

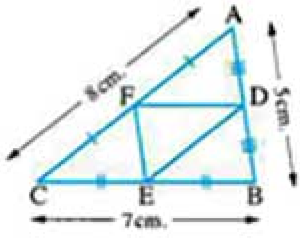
1. The line segment joining the midpoints of two sides of a triangle is parallel to ....
2. The image of the point (2 , – 4) by reflection in y-axis is ....
3. The number of axes of symmetry of a rectangle is ....
4. The measure of the exterior angle of an equilateral triangle equals ....°
5. The volume of a cube of edge length 6 cm. is .... cm^3.

3 [a] In the opposite figure :

ABC is a triangle , D , E and F are the midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CA}$ respectively

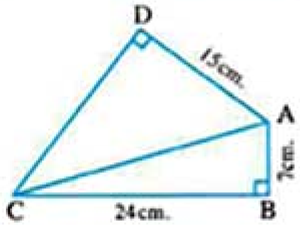
where AB = 5 cm. , BC = 7 cm. and CA = 8 cm.

Calculate : The perimeter of Δ DEF



[b] On square lattice , draw the square ABCD where A (1 , 2) , B (– 2 , 2) , C (– 2 , 5) and D (1 , 5) , then draw its image by reflection in x-axis.

4 [a] **In the opposite figure :**



m (∠ B) = m (∠ D) = 90°

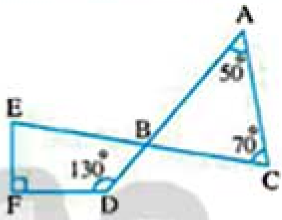
AD = 15 cm. , AB = 7 cm. and BC = 24 cm.

Find : The length of each of $\overline{AC}$, $\overline{DC}$

[b] Draw Δ ABC where A (1 , 5) , B (3 , 1) and C (5 , 3)

, then draw its image by rotation about the origin point with an angle of measure 180°

5 [a] **In the opposite figure :**



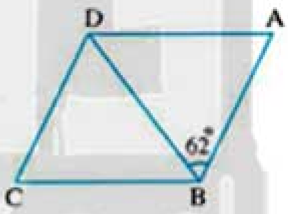
$\overline{CE} \cap \overline{AD} = \{B\}$

, m (∠ A) = 50° , m (∠ C) = 70°

, m (∠ D) = 130° and m (∠ F) = 90°

Find : m (∠ E)

[b] **In the opposite figure :**



ABCD is a rhombus

, $\overline{BD}$ is a diagonal in it

, m (∠ ABD) = 62°

Find with proof : m (∠ A)

2 Cairo Governorate

East Nasr City Zone
Manaret Heliopolis School

Answer the following questions :

1 **Complete :**

1 The sum of measures of the exterior angles of the heptagon is ....°

2 If two lines intersect , then each two vertically opposite angles are ....

3 In Δ ABC , if m (∠ A) + m (∠ C) = m (∠ B) , then m (∠ B) = ...°

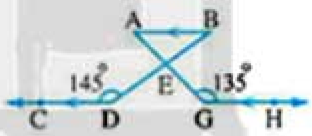
4 The image of (2 , 3) by translation (x , y) ⟶ (x + 4 , y – 2) is ....

5 The length of the line segment joining two midpoints of two sides of a triangle equals .... the length of the third side.

2 Choose the correct answer :

1. ABCD is a parallelogram in which m (∠ A) = 80° , then m (∠ C) = ...
   (a) 80° (b) 100° (c) 120° (d) 60°
2. If the image of the point (5 , – 3) by rotation about the origin point is itself , then the measure of the rotation angle is ....°
   (a) 90 (b) 180 (c) 270 (d) 360
3. The line segment joining two midpoints of two sides of a triangle is .... the third side.
   (a) intersecting (b) parallel to (c) perpendicular to (d) congruent to
4. The sum of measures of the accumulative angles at a point is ....°
   (a) 90 (b) 180 (c) 270 (d) 360
5. If ABC is a right-angled triangle at B and AB = 4 cm. , BC = 3 cm. , then AC = ... cm.
   (a) 16 (b) 25 (c) 9 (d) 5
6. The sum of measures of the interior angles of a hexagon is ....°
   (a) 360 (b) 540 (c) 720 (d) 120

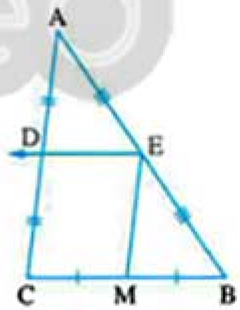
3 [a] In the opposite figure :



ABE is a triangle , $\overline{AB} \parallel \overline{GH} \parallel \overline{CD}$, m (∠ CDB) = 145° , m (∠ AGH) = 135°

Calculate : m (∠ DEG)

[b] In the opposite figure :



ABC is a triangle in which E , M and D are the midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{CA}$ respectively

Prove that : DEMC is a parallelogram.

4 [a] In the opposite figure :



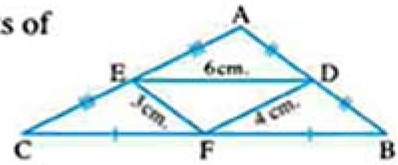
m (∠ ACB) = 90° , AB = 13 cm. , AD = 3 cm. , CD = 4 cm. , BC = 12 cm.

Find : 1 The length of $\overline{AC}$

2 The perimeter of the figure ABCD

[b] In the opposite figure :

ABC is a triangle in which : D , F and E are the midpoints of $\overline{AB}$, $\overline{BC}$ and $\overline{CA}$ respectively such that : DF = 4 cm. , FE = 3 cm. , DE = 6 cm.

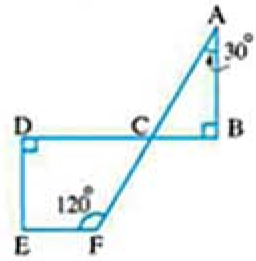


Calculate : The perimeter of Δ ABC

5 [a] Using the lattice , find the images of the points :

A (– 4 , 1) , B (0 , 4) and C (– 2 , 2) by reflection in X-axis.

[b] In the opposite figure :



$\overline{AB} \perp \overline{BC}$, $\overline{ED} \perp \overline{CD}$, $\overline{BD} \cap \overline{AF} = \{C\}$

, m (∠ A) = 30° , m (∠ F) = 120°

Find with proof : 1 m (∠ ACB) 2 m (∠ E)

3 Giza Governorate

El-haram Directorate
Fadl language School

Answer the following questions :

1 Complete :

1 The image of the point (2 , – 1) by reflection in X-axis is ....

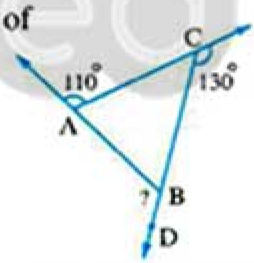
2 ABCD is a parallelogram in which m (∠ A) = 60° , then m (∠ B) = ...°

3 The measure of each angle of the regular hexagon equals ....°

4 The length of the line segment that joins two midpoints of two sides of a triangle equals .... the length of the third side.

5 **In the opposite figure :**

m (∠ ABD) = ...°



2 Choose the correct answer :

1 The number of the diagonals of a pentagon is ....

(a) 3 (b) 5 (c) 7 (d) 9

2 The image of the point (2 , 5) by rotation about the origin point with an angle of measure 90° is ....

(a) (– 5 , 2) (b) (5 , – 2) (c) (– 2 , – 5) (d) (– 2 , 5)

3 ABC is a right-angled triangle at A , then $(AC)^2 = (BC)^2$ .... $(AB)^2$

(a) + (b) × (c) ÷ (d) –

4 The number of axes of symmetry of the rectangle is ....

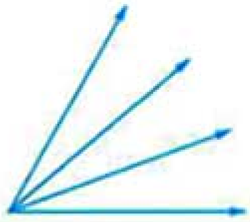
(a) 1 (b) 2 (c) 3 (d) 4

5 If the total surface area of a cuboid = 148 cm^2 and its lateral surface area = 118 cm^2 , then its base area = ... cm^2

(a) 30 (b) 15 (c) 45 (d) 266

6 Number of acute angles in the opposite figure is ....

(a) 3 (b) 4 (c) 5 (d) 6



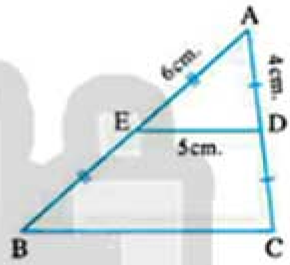
3 [a] **In the opposite figure :**

E and D are midpoints of $\overline{AB}$ and $\overline{AC}$

, AE = 6 cm. , ED = 5 cm.

, AD = 4 cm.

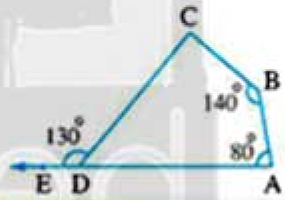
, Calculate the perimeter of Δ ABC



[b] **In the opposite figure :**

$D \in \overrightarrow{AE}$

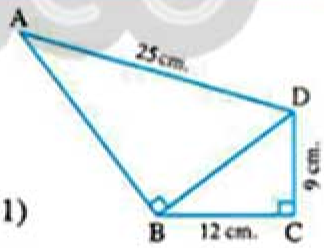
Find : m (∠ C)



4 [a] **In the opposite figure :**

m (∠ C) = m (∠ ABD) = 90°

Find : The length of each of $\overline{BD}$ and $\overline{AB}$

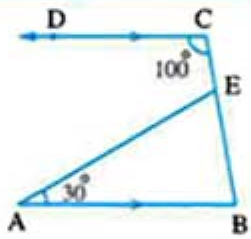


[b] On the square lattice , draw Δ ABC where A (0 , 5) , B (2 , 1) , C (4 , 7) , then draw the image of Δ ABC by reflection in y-axis.

5 [a] **In the opposite figure :**

$\overrightarrow{BA} \parallel \overrightarrow{CD}$, m (∠ C) = 100° , m (∠ A) = 30°

Find : m (∠ AEC)



[b] On the square lattice , draw $\overline{AB}$ where A (4 , 3) , B (– 1 , 1) , then draw the image of $\overline{AB}$ by translation : $(x , y) \longrightarrow (x + 2 , y - 1)$

4 Giza Governorate

Experimental Schools Math inspector

Answer the following questions :

1 Complete the following :

1 The image of the point (5 , – 3) under rotation of an angle of measure 90° about the origin point is ....

2 The ray which is drawn from the midpoint of a side in a triangle parallel to another side .... the third side.

3 In the rhombus the two diagonals are ....

4 The sum of measures of the exterior angles of any convex polygon equals ....°

5 In Δ ABC , if m (∠ A) + m (∠ B) = m (∠ C) , then Δ ABC is ....

2 Choose the correct answer :

1 If the measure of an interior angle of a regular polygon is 135° , then the number of its sides is ....

(a) 6 (b) 4 (c) 7 (d) 8

2 The image of the point (– 1 , 4) by the translation (X , y) ⟶ (X + 3 , y – 2) followed by reflection in the X-axis is ....

(a) (2 , 2) (b) (– 2 , 2) (c) (– 2 , –2) (d) (2 , – 2)

3 ABCD is a parallelogram in which m (∠ A) + m (∠ C) = 110° , then m (∠ B) = ...°

(a) 125 (b) 80 (c) 100 (d) 110

4 The concave polygon should have .... angle.

(a) an acute (b) a right (c) an obtuse (d) a reflex

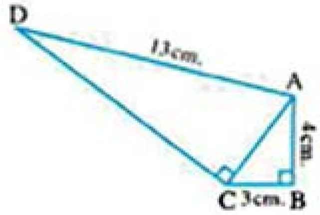
5 The image of the point .... is itself by reflection in y-axis.

(a) (0 , 3) (b) (3 , 0) (c) (3 , 3) (d) (– 3 , 3)

6 The identity rotation about the origin point with an angle of measure ....°

(a) 90 (b) 180 (c) 360 (d) – 90

3 [a] **In the opposite figure :**



ABCD is a quadrilateral in which

m (∠ B) = m (∠ ACD) = 90°

, AB = 4 cm. , BC = 3 cm. and AD = 13 cm.

Find : AC and DC

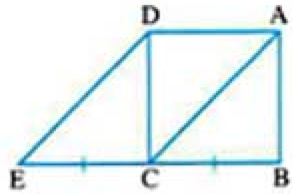
[b] In the opposite figure :

ABCD is a square , E ∈ $\overrightarrow{BC}$

such that BC = CE

1 **Prove that :** The figure ACED is a parallelogram.

2 **Find :** m (∠ E)

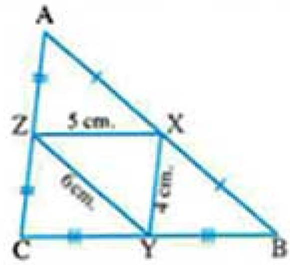


4 [a] In the opposite figure :

Δ ABC in which X , Y and Z are the midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CA}$ respectively

, XZ = 5 cm. , XY = 4 cm. , YZ = 6 cm.

Find with proof : The perimeter of Δ ABC

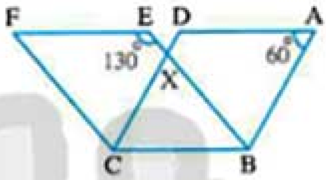


[b] In the opposite figure :

ABCD and EBCF are two parallelograms

, m (∠ BAD) = 60° , m (∠ BEF) = 130°

Find with proof : m (∠ BXC)

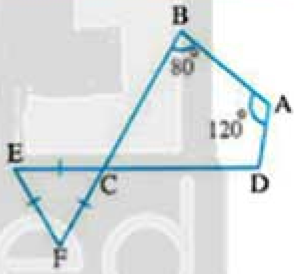


5 [a] In the opposite figure :

ABCD is a quadrilateral in which m (∠ A) = 120°

, m (∠ B) = 80° , Δ CEF is an equilateral triangle

Find : m (∠ D)



[b] Using the square lattice draw Δ ABC where :

A (2 , 4) , B (4 , 2) and C (3 , 1) , then map its image by the translation

$(x , y) \longrightarrow (x + 2 , y + 3)$

5 Alexandria Governorate

East Educational Zone
Mathematics Directing

Answer the following questions :

1 Choose the correct answer :

1 The measure of the exterior angle of the equilateral triangle = ...

(a) 60° (b) 120° (c) 90° (d) 180°

2 The diagonals are equal in length and not perpendicular in ....

(a) parallelogram. (b) rectangle. (c) rhombus. (d) square.

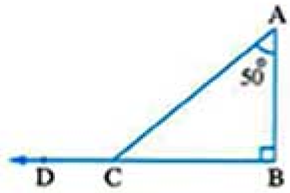
3 The image of the point (– 1 , 3) by translation (4 , – 2) is ....

(a) (3 , 1) (b) (3 , – 1) (c) (5 , 1) (d) (5 , – 5)

4 The measure of the interior angle of the regular hexagon is ....

(a) 60° (b) 108° (c) 120° (d) 135°

5 **In the opposite figure :**



m (∠ ACD) = ...

(a) 40° (b) 140°

(c) 90° (d) 50°

6 If two adjacent sides in a parallelogram are equal in length , then it is a ....

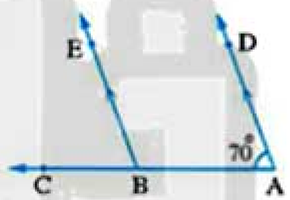
(a) square. (b) rhombus. (c) rectangle. (d) trapezium.

2 Complete :

1 The length of the line segment joining two midpoints of two sides of a triangle ....

2 The angle of measure 89° is .... angle.

3 **In the opposite figure :**



m (∠ EBC) = ...°

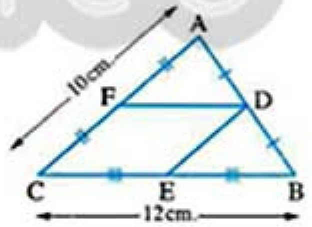
4 The image of (– 3 , 2) by reflection in origin point is ....

5 A rhombus of perimeter 24 cm. its side length equals ....

3

[a] Draw $\overline{AB}$ such that A (2 , 1) , B (2 , 4) , then find its image by translation $(x , y) \longrightarrow (x + 5 , y + 2)$

[b] **In the opposite figure :**



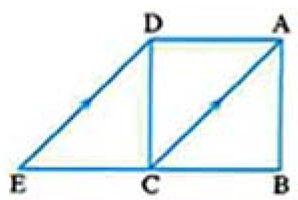
D , E , F are midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CA}$, BC = 12 cm. , AC = 10 cm.

Find : The perimeter of DECF

4

[a] Draw Δ LMN such that L (– 4 , – 1) , M (– 1 , – 3) , N (0 , – 1) , then find its image by reflection in x-axis.

[b] **In the opposite figure :**



ABCD is a square , E ∈ $\overrightarrow{BC}$, $\overline{AC}$ // $\overline{DE}$

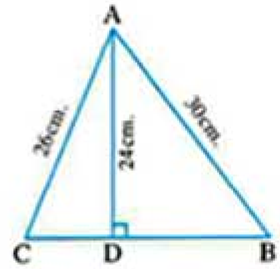
Prove that : ACED is a parallelogram.

5 [a] Find the number of sides of a regular polygon if the measure of its interior angle is 140°

[b] **In the opposite figure :**

Find the length of $\overline{BC}$

and the area of Δ ABC



6 Alexandria Governorate

Middle Educational Zone
Math's Supervision

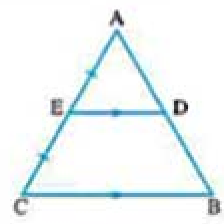
Answer the following questions :

1 Complete each of the following :

1. The measure of the straight angle equals ....°
2. The image of the point (4 , – 2) by reflection in X-axis is ....
3. The ray drawn from the midpoint of a side parallel to another side in a triangle ....
4. The image of the point (– 2 , 1) by rotation with an angle of measure 180° about origin point is ....
5. The length of line segment joining the midpoints of two sides of a triangle equals ....
6. A rhombus is a .... with two adjacent equal sides in length.

2 Choose the correct answer :

1. The perimeter of a square with side length 1 cm. equals .... cm.
(a) 5 (b) 1 (c) 4 (d) 2
2. The number of diagonals in a pentagon is ....
(a) 0 (b) 3 (c) 4 (d) 5
3. The edge length of a cube whose volume is 27 cm^3 is .... cm.
(a) 9 (b) 3 (c) 27 (d) 6
4. In Δ ABC , if m (∠ B) = 90° , AB = 3 cm. , BC = 4 cm. , then AC = ... cm.
(a) 7 (b) 12 (c) 1 (d) 5
5. In the opposite figure : CB : ED = ...
(a) 1 : 1 (b) 1 : 2 (c) 2 : 1 (d) 1 : 4

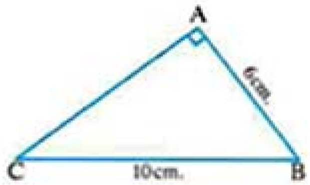


3 [a] **In the opposite figure :**

ABC is a right-angled triangle at A

, BC = 10 cm. , AB = 6 cm.

Find : The length of $\overline{AC}$

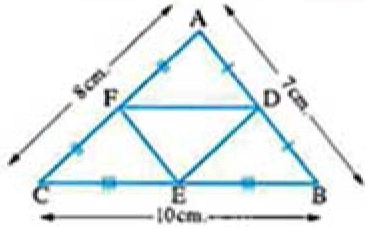


[b] Draw the image of the rectangle XYZL where X (– 5 , 1) , Y (– 5 , 4) , Z (– 1 , 4) , L (– 1 , 1) by reflection in the x-axis.

4 [a] **In the opposite figure :**

BC = 10 cm. , AB = 7 cm. , AC = 8 cm.

Calculate : The perimeter of Δ FDE



[b] The ratio between the measures of the angles of a quadrilateral is 2 : 2 : 3 : 5

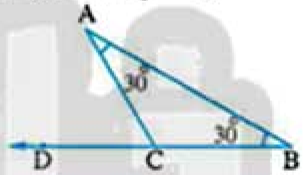
Calculate : The measure of the biggest angle.

5 [a] Find the image of the point A (5 , – 5) by translation $(x , y) \longrightarrow (x - 2 , y - 3)$

[b] **In the opposite figure :**

m (∠ A) = m (∠ B) = 30°

Find showing steps : m (∠ ACD)



7 El-Kalyoubia Governorate

Al-Obour Directorate of Education
Memphis Language School

Answer the following questions :

1 **Choose the correct answer from those given :**

1. The sum of the measures of the interior angles of a triangle equals ....
   (a) 90° (b) 180° (c) 270° (d) 360°

2. The image of the point (– 1 , 3) by translation (4 , – 2) is ....
   (a) (3 , 1) (b) (3 , – 1) (c) (5 , 1) (d) (5 , – 5)

3. The measure of the exterior angle of the equilateral triangle is ....
   (a) 30° (b) 45° (c) 60° (d) 120°

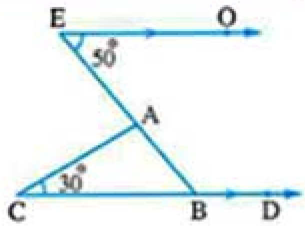
4. In a parallelogram if the adjacent sides are equal in length , then the shape is a ....
   (a) square. (b) rhombus. (c) rectangle. (d) trapezium.

5. The number of the diagonals of a pentagon is ....
   (a) 3 (b) 5 (c) 7 (d) 9

2 Complete the following :

1. The line segment joining the midpoints of two sides of a triangle is .... the third side.
2. If Δ XYZ is a right-angled triangle at X , XY = 12 cm. and XZ = 9 cm.
   , then YZ = ...
3. If ABCD is a rhombus , then .... ⊥ ....
4. The image of the point (– 1 , 2) by rotation about the origin point with an angle of measure 90° is ....
5. The sum of the measures of the accumulative angles about a point = ...

3 [a] In the opposite figure :

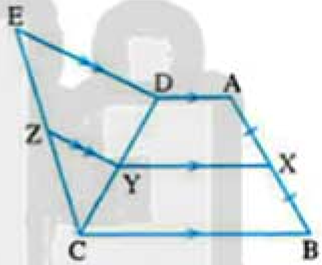


$\overrightarrow{EO} \parallel \overrightarrow{CD}$, m (∠ E) = 50°

, m (∠ C) = 30°

Find : The measures of the angles of Δ ABC , m (∠ ABD)

[b] In the opposite figure :



X is the midpoint of $\overline{AB}$

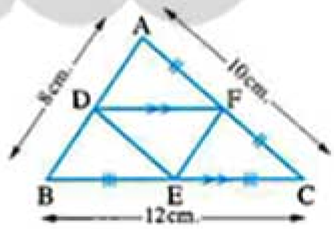
, Y ∈ $\overline{CD}$, Z ∈ $\overline{CE}$

, $\overline{AD} \parallel \overline{XY} \parallel \overline{BC}$, $\overline{YZ} \parallel \overline{DE}$

Is CZ = ZE ? Giving reason.

4 [a] Using the square lattice , draw Δ ABC , where A (– 2 , 3) , B (2 , 3) , C (2 , 6) , then find its image by translation (x , y) ⟶ (x + 2 , y – 1)

[b] In the opposite figure :



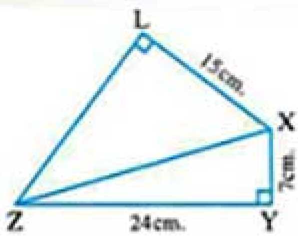
D , E , F are midpoints of

$\overline{AB}$, $\overline{BC}$, $\overline{CA}$ respectively

, AB = 8 cm. , BC = 12 cm. , AC = 10 cm.

Find : The perimeter of Δ DEF

5 [a] In the opposite figure :



XYZL is a quadrilateral in which m (∠ Y) = m (∠ L) = 90°

, XY = 7 cm. , YZ = 24 cm. , XL = 15 cm.

Find : The length of each of $\overline{XZ}$ and $\overline{LZ}$

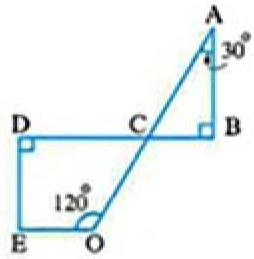
[b] In the opposite figure :

$\overline{AB}$ and $\overline{ED}$ are perpendicular to $\overline{BD}$

, $\overline{BD} \cap \overline{AO} = \{C\}$

, m (∠ A) = 30 , m (∠ EOC) = 120°

Find : m (∠ E)



8 El-Gharbia Governorate

Official Language Schools
The Central Maths Supervision

Answer the following questions :

1 Choose the correct answer :

1. The measure of the exterior angle of the equilateral triangle equals ....°
   (a) 30 (b) 45 (c) 60 (d) 120
2. If the image of the point (5 , – 3) by rotation around the origin point is itself , then the measure of the rotation angle equals ....°
   (a) 90 (b) 270 (c) 180 (d) 360
3. The image of a square by rotation around the origin point with an angle of measure 90° is a ....
   (a) rectangle. (b) square. (c) rhombus. (d) trapezium.
4. Any triangle has at least .... acute angles.
   (a) 0 (b) 1 (c) 2 (d) 3
5. The measure of the interior angle of the regular hexagon equals ....°
   (a) 60 (b) 108 (c) 120 (d) 135
6. The image of the point (– 5 , 0) by reflection in x-axis is ....
   (a) (5 , 0) (b) (0 , 5) (c) (– 5 , 0) (d) (0 , – 5)

2 Complete :

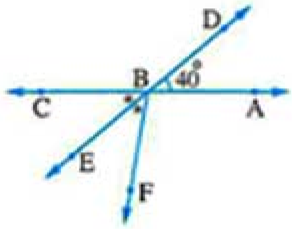
1. The line segment joining the midpoints of two sides of a triangle is ....
2. If ABCD is a parallelogram in which m (∠ A) = 60° , then m (∠ B) = ...°
3. The image of the point (3 , 2) by reflection in the origin point is ....
4. Each two opposite angles in a parallelogram are ....
5. The rectangle is a parallelogram in which one of its angles is ....

3 **[a] In the opposite figure :**

$\overleftrightarrow{AC} \cap \overleftrightarrow{DE} = \{B\}$, m (∠ ABD) = 40°

and $\overrightarrow{BE}$ bisects ∠ CBF

Find with proof : m (∠ ABF)

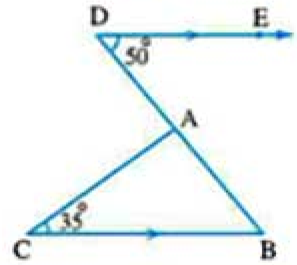


[b] In the opposite figure :

$\overrightarrow{DE}$ // $\overrightarrow{CB}$, m (∠ D) = 50° , m (∠ C) = 35°

Find with proof :

m (∠ B) , m (∠ BAC)

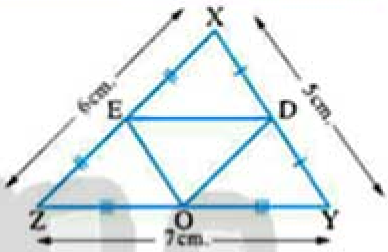


4 **[a] In the opposite figure :**

XYZ is a triangle in which XY = 5 cm.

, XZ = 6 cm. , YZ = 7 cm.

Find with proof : The perimeter of Δ DOE



[b] On the square lattice , draw the triangle whose vertices are A (4 , 4) , B (4 , 2) , C (1 , 2) , then find its image by the translation (– 4 , – 2)

5 **[a] In the opposite figure :**

m (∠ B) = m (∠ ACD) = 90°

, AB = 12 cm. , BC = 9 cm. , CD = 20 cm.

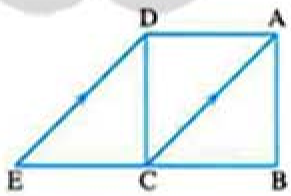
Find : The length of $\overline{AD}$



[b] In the opposite figure :

ABCD is a square , E ∈ $\overrightarrow{BC}$, $\overline{AC}$ // $\overline{DE}$

Prove that : ACED is a parallelogram.



9 El-Dakahlia Governorate

Dakahlia Directorate of Education
Math's Supervision

Answer the following questions :

1 **Choose the correct answer :**

1 The sum of measures of the interior angles of the hexagon equals ....

(a) 270° (b) 180° (c) 720° (d) 360°

2 The side length of a rhombus whose perimeter 8 cm. = ...

(a) 32 cm. (b) 2 cm. (c) 16 cm. (d) 12 cm.

3 The measure of each angle of a regular triangle equals ....

(a) 60° (b) 108° (c) 120° (d) 135°

4 The parallelogram whose diagonals are perpendicular and equal in length is called ....

(a) rhombus. (b) square. (c) rectangle. (d) trapezium.

5 The image of the point (– 3 , 5) by rotation about the origin point with an angle of measure 270° is ....

(a) (5 , 3) (b) (– 5 , 3) (c) (3 , 5) (d) (– 5 , – 3)

6 Any triangle has at least .... acute angles.

(a) zero (b) 1 (c) 2 (d) 3

2 Complete each of the following :

1 The measure of the exterior angle of an equilateral triangle equals ....

2 If Δ ABC is right-angled triangle at B , m (∠ A) = 55° , then m (∠ C) = ...

3 The parallelogram whose perimeter 28 cm. and the length of one of its sides is 10 cm. , then the length of its adjacent side equals ....

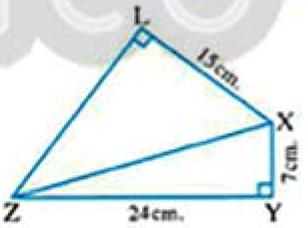
4 If the image of the point A (X , y) by a translation (1 , – 4) is the point (3 , – 2) , then point A is (.............. , ...)

5 The rectangle is a parallelogram in which one of its angles is ....

3 [a] In the opposite figure :

XYZL is quadrilateral in which m (∠ Y) = m (∠ L) = 90° , XY = 7 cm. , YZ = 24 cm. , XL = 15 cm.

Find : The length of each of $\overline{XZ}$, $\overline{LZ}$

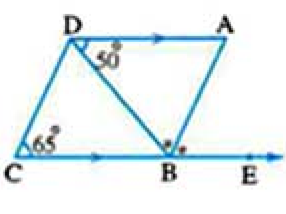


[b] Draw on square lattice the image of triangle ABC where A (0 , 1) , B (3 , 4) , C (5 , 1) by reflection in y-axis.

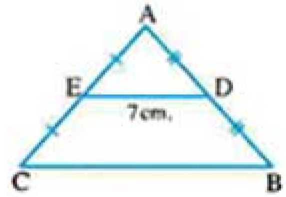
4 [a] In the opposite figure :

$\overrightarrow{DA}$ // $\overrightarrow{CE}$, $\overrightarrow{BA}$ bisects ∠ DBE , m (∠ ADB) = 50° , m (∠ C) = 65°

Prove that : ABCD is a parallelogram.



[b] In the opposite figure :



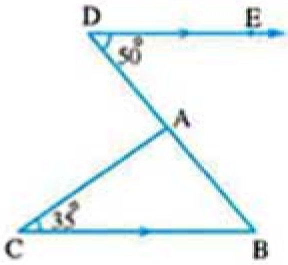
ABC is a triangle in which

D and E are the midpoints of $\overline{AB}$ and $\overline{AC}$ respectively

, $\overline{DE}$ = 7 cm.

Find : The length of $\overline{BC}$

5 **[a] In the opposite figure :**



$\overrightarrow{DE}$ // $\overline{CB}$

, m (∠ D) = 50°

, m (∠ C) = 35°

Find : m (∠ B) and m (∠ BAC)

[b] Draw Δ OBC on a square lattice where O (0 , 0) , B (3 , 0) , C (0 , 4) , then find its image by rotation about the origin point with an angle of measure (– 180°)

10 Suez Governorate

Directorate of Education
Math Supervision

Answer the following questions :

1 **Choose the correct answer :**

1 The two diagonals are equal in length and not perpendicular in a ....

(a) parallelogram. (b) rectangle. (c) square. (d) rhombus.

2 The image of (1 , 3) by translation (4 , 2) is ....

(a) (3 , 1) (b) (5 , 5) (c) (5 , 1) (d) (5 , – 5)

3 The measure of an exterior angle in an equilateral triangle is ....°

(a) 30 (b) 45 (c) 60 (d) 120

4 In a parallelogram if the two adjacent sides are equal in length , then the shape is a ....

(a) square. (b) rhombus. (c) rectangle. (d) trapezium.

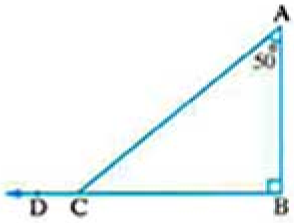
5 The number of axes of symmetry of the equilateral triangle is ....

(a) 0 (b) 1 (c) 2 (d) 3

6 The sum of measures of the interior angles of a triangle is ....°

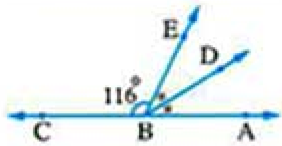
(a) 90 (b) 360 (c) 180 (d) 540

2 **Complete :**



1. In the opposite figure : m (∠ ACD) = ...°
2. The ray drawn from the midpoint of one side of a triangle parallel to another side ....
3. The image of the point (1 , – 2) by reflection in X-axis is ....
4. The sum of measures of the interior angles of the pentagon is ....°
5. If ABCD is a rhombus , then .... ⊥ ....

3 **[a] In the opposite figure :**

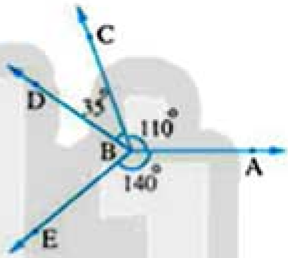


B ∈ $\overleftrightarrow{AC}$, m (∠ CBE) = 116°

, $\overrightarrow{BD}$ bisects ∠ ABE

Find : m (∠ ABD)

[b] In the opposite figure :

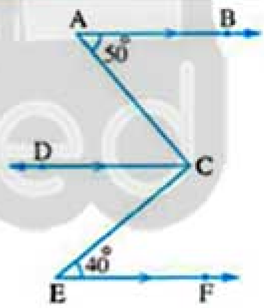


m (∠ ABC) = 110° , m (∠ CBD) = 35°

, m (∠ ABE) = 140°

Find : m (∠ DBE)

4 **[a] In the opposite figure :**

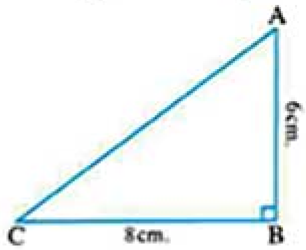


$\overrightarrow{AB}$ // $\overrightarrow{CD}$ // $\overrightarrow{EF}$

, m (∠ A) = 50° , m (∠ E) = 40°

Find with proof : m (∠ ACE)

[b] In the opposite figure :



Δ ABC is right-angled at B

, AB = 6 cm. , BC = 8 cm.

Find : The length of $\overline{AC}$

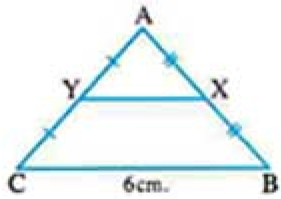
5 **[a] Complete :**

1. The image of (3 , 2) by rotation about the origin point with an angle of measure 90° is ....
2. The image of (3 , 2) by reflection in the origin point is ....

3 The image of (3 , 2) by rotation about the origin point with an angle of measure 180° is ....

4 In the opposite figure :

XY = ... cm.

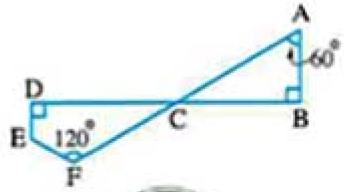


[b] In the opposite figure :

$\overline{AB}$, $\overline{DE}$ are perpendicular to $\overline{BD}$

, $\overline{BD} \cap \overline{AF} = \{C\}$, m (∠ A) = 60° , m (∠ CFE) = 120°

Find with proof : m (∠ E)



11 Damietta Governorate

Damietta inspection of Mathematic official language schools

Answer the following questions :

1 Choose the correct answer :

1 The measure of each angle of the regular pentagon equals ....°

(a) 60 (b) 108 (c) 120 (d) 135

2 The image of the point (2 , – 7) by reflection in the origin point is ....

(a) (2 , 7) (b) (– 2 , 7) (c) (– 2 , – 7) (d) (2 , – 7)

3 Any triangle has at least two .... angles.

(a) reflex (b) obtuse (c) acute (d) right

4 ABCD is parallelogram in which : m (∠ A) + m (∠ C) = 100 , then m (∠ B) = ...°

(a) 50 (b) 150 (c) 130 (d) 80

5 The ratio between the perimeter of an equilateral triangle and its side length = ...

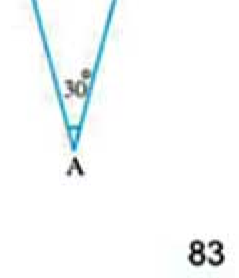
(a) 3 : 1 (b) 3 : 2 (c) 1 : 3 (d) 2 : 3

6 **In the opposite figure :**

m (∠ ABD) = ...°

(a) 150 (b) 95

(c) 105 (d) 115



2 **Complete each of the following :**

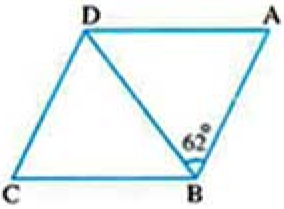
1. The ray drawn from the midpoint of a side of a triangle parallel to another side ....
2. The image of the point (3 , – 2) by rotation with an angle of measure 90° about the origin is ....
3. If m (∠ B) = 90° , then m (reflex ∠ B) = ...°
4. If ABC is right-angled triangle at B , AB = 3 cm. and BC = 4 cm. , then AC = ... cm.
5. This figure  has .... line (s) of symmetry.

3 **[a] In the opposite figure :**

ABCD is a rhombus in which

, $\overline{BD}$ is a diagonal and m (∠ ABD) = 62°

Find with proof : m (∠ A)

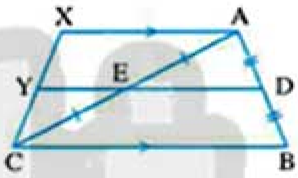


[b] In the opposite figure :

AD = BD , AE = EC , $\overline{AX}$ // $\overline{BC}$

, $\overleftrightarrow{DE}$ ∩ $\overline{XC}$ = {Y}

Prove that : Y is the midpoint of $\overline{XC}$



4 **[a] In the opposite figure :**

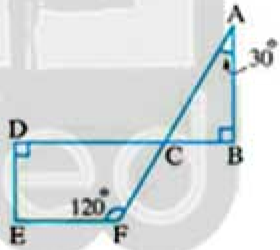
$\overline{AB}$ and $\overline{ED}$ are perpendicular to $\overline{BD}$

, $\overline{BD}$ ∩ $\overline{AF}$ = {C}

, m (∠ A) = 30°

, m (∠ EFC) = 120°

Find : m (∠ E)



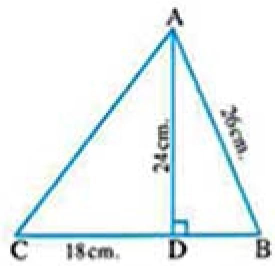
[b] In the opposite figure :

ABC is a triangle and $\overline{AD}$ ⊥ $\overline{BC}$

If AD = 24 cm. , AB = 26 cm.

and CD = 18 cm.

Find : The length of each of $\overline{AC}$, $\overline{DB}$



5 **[a]** On the square lattice find the image of the triangle LMN where :

L (– 4 , – 1) , M (– 1 , – 3) , N (0 , – 1) by reflection in the x-axis.

[b] Using the square lattice , draw $\overline{AB}$ where A (4 , 3) , B (– 1 , 1) then find the image of $\overline{AB}$ by translation (x , y) ⟶ (x + 2 , y – 1)

12 Kafr El-Sheikh Governorate

General Maths Supervision

Answer the following questions :

1 Choose the correct answer :

1 The sum of measures of the interior angles of a hexagon equals ....°

(a) 180 (b) 540 (c) 720 (d) 360

2 The two diagonals are equal in length and perpendicular in the ....

(a) trapezium. (b) square. (c) rectangle. (d) parallelogram.

3 In Δ XYZ , if m ($\angle$ X) > m ($\angle$ Y) + m ($\angle$ Z) , then $\angle$ X is .... angle.

(a) an acute (b) an obtuse (c) a right (d) a straight

4 The image of (3 , – 5) by rotation R (O , 90°) is ....

(a) (– 3 , 5) (b) (– 3 , – 5) (c) (5 , 3) (d) (5 , – 3)

5 The sum of the measures of the exterior angles of a triangle equals ....°

(a) 60 (b) 120 (c) 270 (d) 360

6 The measure of the exterior angle of the equilateral triangle is ....°

(a) 90 (b) 120 (c) 360 (d) 60

2 Complete :

1 The image of A (– 2 , 3) by translation (x + 3 , y – 2) is ....

2 The rhombus with a right angle is ....

3 The image of (– 1 , 2) by reflection in the origin point is ....

4 The length of the line segment joining two midpoints of two sides of a triangle is equal to .... the length of the third side.

5 If ABCD is a parallelogram in which BC = 8 cm. and CD = 6 cm. , then its perimeter = ... cm.

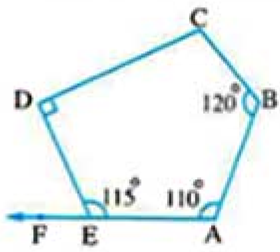
3 [a] In the opposite figure :

ABCDE is a pentagon in which F $\in \overrightarrow{AE}$

, m ($\angle$ A) = 110° , m ($\angle$ B) = 120° , m ($\angle$ DEA) = 115°

, m ($\angle$ D) = 90°

Find with proof : m ($\angle$ C)

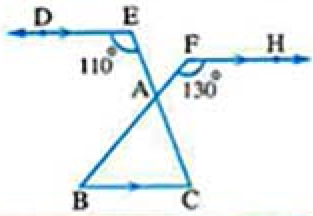


[b] In the opposite figure :

$\overrightarrow{ED} \parallel \overrightarrow{BC} \parallel \overrightarrow{FH}$

, m (∠ E) = 110° , m (∠ F) = 130°

Find with proof : m (∠ BAC)



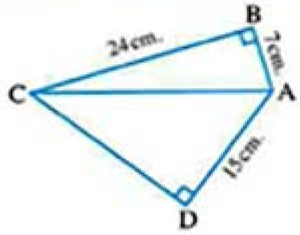
4 **[a] In the opposite figure :**

ABCD is a quadrilateral in which

m (∠ B) = m (∠ D) = 90°

, AB = 7 cm. , BC = 24 cm. and AD = 15 cm.

Find : The length of each of $\overline{AC}$ and $\overline{DC}$

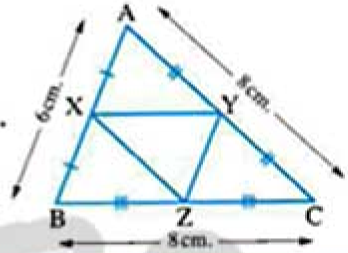


[b] In the opposite figure :

AB = 6 cm. , BC = 8 cm. , AC = 8 cm.

, X , Y , Z are the midpoints of $\overline{AB}$, $\overline{AC}$ and $\overline{BC}$ respectively.

Find with proof : The perimeter of Δ XYZ



5 **[a]** On a square lattice , draw Δ ABC , where A (2 , 4) , B (2 , 1) and C (6 , 1)

, then draw its image by :

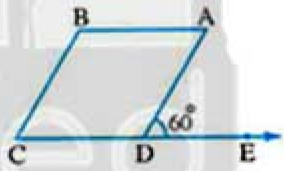
1 reflection in the y-axis. 2 rotation (O , 180°)

[b] In the opposite figure :

ABCD is a parallelogram , E ∈ $\overrightarrow{CD}$

, m (∠ ADE) = 60°

Find with proof : m (∠ B)



13 El-Beheira Governorate

Delengat Educational Directorate
Bani El-Delengat G.L.S

Answer the following questions :

1 **Complete :**

1 In the right-angled triangle , area of the square drawn on the hypotenuse equals ....

2 The reflection in a line reserves .... , ...

3 The measure of the exterior angle of the triangle is equal to the sum of ....

4 (– 3 , 2) is the image of the point (3 , 2) by reflection in .... axis.

5 The line segment joining the midpoints of two sides of the triangle is .... the third side.

2 Choose the correct answer :

1 The image of the point (– 1 , 3) by translation (4 , – 2) is ....

(a) (3 , 1) (b) (3 , – 1) (c) (5 , 1) (d) (5 , – 5)

2 The measure of the exterior angle of the equilateral triangle equals ....

(a) 60° (b) 100° (c) 120° (d) 150°

3 The image of the point (– 3 , 5) by rotation about the origin point by an angle of measure 90° is ....

(a) (5 , 3) (b) (5 , – 3) (c) (– 5 , – 3) (d) (– 5 , 3)

4 The sum of measures of the exterior angles of any polygon = ...

(a) 180° (b) 360° (c) 120° (d) 540°

5 The number of lines of symmetry of the square = ...

(a) 1 (b) 2 (c) 3 (d) 4

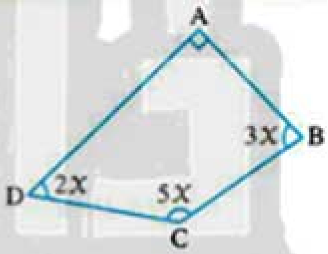
6 The parallelogram whose diagonals are .... is a rectangle.

(a) parallel (b) perpendicular (c) equal in length (d) bisect each other

3 [a] In the opposite figure :

m (∠ A) = 90°

Find the value of : x

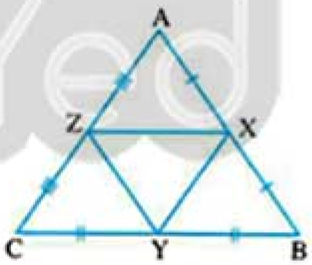


[b] In the opposite figure :

AC = AB = 7 cm.

, BC = 8 cm.

Find : The perimeter of Δ XYZ

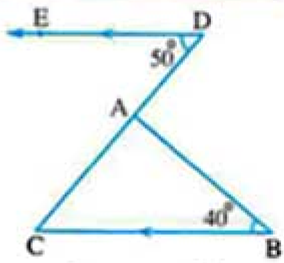


4 [a] In the opposite figure :

$\overrightarrow{DE}$ // $\overline{BC}$, m (∠ D) = 50°

, m (∠ B) = 40°

Find : m (∠ BAC)

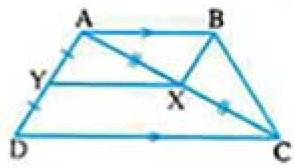


[b] In the opposite figure :

$\overline{AB}$ // $\overline{DC}$, AB = $\frac{1}{2}$ DC

, X is the midpoint of $\overline{AC}$, Y is the midpoint of $\overline{AD}$

Prove that : ABXY is a parallelogram.

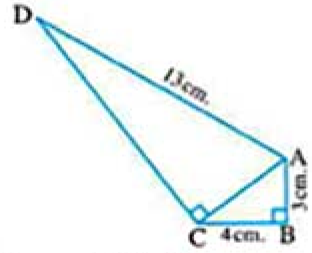


5 [a] **In the opposite figure :**

m (∠ B) = m (∠ ACD) = 90°

, AB = 3 cm. , BC = 4 cm. , AD = 13 cm.

Find : The length of each of $\overline{AC}$ and $\overline{DC}$



[b] On the square lattice , draw Δ ABC where A (1 , 1) , B (4 , 1) , C (4 , 4) , then find the image of Δ ABC by reflection in X-axis.

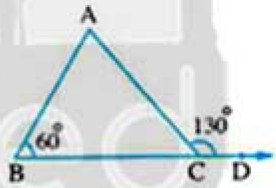
14 Souhag Governorate

Math Supervision

Answer the following questions :

1 **Choose the correct answer from those given :**

1. The sum of the measures of the interior angles of a pentagon equals ....°
   (a) 108 (b) 180 (c) 540 (d) 720
2. In the .... the two diagonals are perpendicular and not equal in length.
   (a) square (b) rectangle (c) rhombus (d) parallelogram
3. The image of the point (– 2 , 3) by reflection in the y-axis is the point ....
   (a) (3 , 2) (b) (– 3 , 2) (c) (2 , 3) (d) (– 3 , – 2)
4. In the opposite figure :
   m (∠ A) = ...
   (a) 40° (b) 50°
   (c) 60° (d) 70°



5. The image of the point (– 1 , 3) by translation (4 , – 2) is ....
   (a) (3 , 1) (b) (3 , – 1) (c) (5 , 1) (d) (5 , – 5)
6. In the triangle ABC , if m (∠ A) = 50° , m (∠ B) = 100° , then m (∠ C) = ...
   (a) 30° (b) 180° (c) 32° (d) 23°

2 **Complete each of the following :**

1. The length of the line segment joining the midpoints of two sides of a triangle is ....
2. If Δ XYZ is a right-angled triangle at X , XY = 12 cm. and XZ = 9 cm. , then YZ = ... cm.
3. The image of the point (– 1 , 2) by rotation about the origin point with an angle of measure 90° is ....

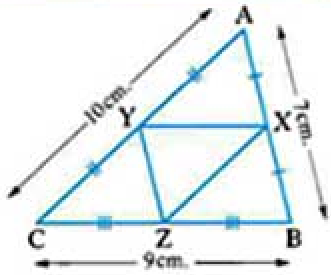
4 If Δ ABC ≡ Δ XYZ , then m (∠ B) = m (∠ ....)

5 The ray drawn from the midpoint of a side of a triangle parallel to another side ....

3 [a] **In the opposite figure :**

X , Y , Z are the midpoints of $\overline{AB}$, $\overline{AC}$, $\overline{BC}$ respectively , AB = 7 cm. , BC = 9 cm. , AC = 10 cm.

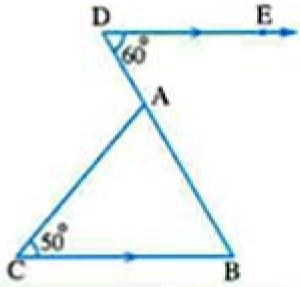
Find : The perimeter of Δ XYZ



[b] **In the opposite figure :**

$\overrightarrow{DE}$ // $\overrightarrow{CB}$, m (∠ D) = 60° , m (∠ C) = 50°

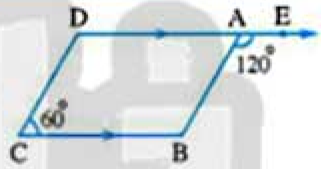
Find : m (∠ DAC)



4 [a] **In the opposite figure :**

$\overrightarrow{DA}$ // $\overrightarrow{BC}$, m (∠ DCB) = 60° , m (∠ EAB) = 120°

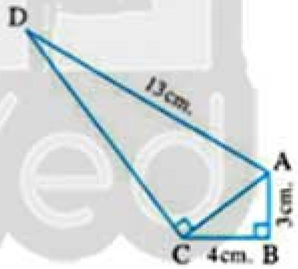
Prove that : ABCD is a parallelogram.



[b] **In the opposite figure :**

m (∠ B) = m (∠ ACD) = 90° , AB = 3 cm. , BC = 4 cm. and AD = 13 cm.

Find : The length of each of $\overline{AC}$, $\overline{CD}$



5 [a] On the square lattice draw Δ ABC , where A (1 , 2) , B (4 , 2) , C (4 , – 1) , then find its image by rotation about the origin point with an angle of measure 180°

[b] **In the opposite figure :**

ABCDEF is a regular hexagon

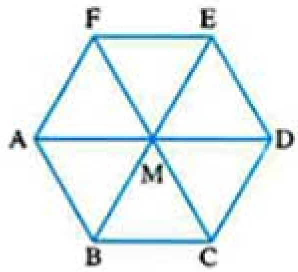
Find the image of Δ ABM by :

1 reflection in $\overleftrightarrow{EB}$

2 translation FE in direction of $\overrightarrow{FE}$

3 rotation (M , 120°)

4 reflection in M



15 Qena Governorate

Qena Directorate of Education
Math's supervision

Answer the following questions :

1 Choose the correct answer :

1 The image of the point (– 3 , 4) by reflection in y-axis is ....

(a) (2 , – 4) (b) (– 3 , – 5) (c) (– 3 , – 4) (d) (3 , 4)

2 ABCD is a parallelogram , m (∠ A) = 60° , then m (∠ B) = ...°

(a) 120 (b) 60 (c) 90 (d) 100

3 ABCD is a parallelogram m (∠ A) = m (∠ B) , then ABCD is a ....

(a) rectangle. (b) square. (c) rhombus. (d) trapezium.

4 Measure of each angle in the regular pentagon = ...

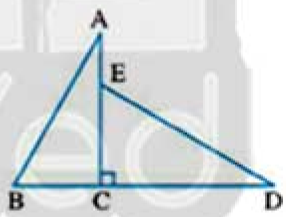
(a) 108° (b) 100° (c) 90° (d) 60°

5 The image of the point (– 1 , – 2) by translation (3 , 1) is ....

(a) (1 , 2) (b) (2 , – 1) (c) (0 , 2) (d) (3 , – 2)

6 **In the opposite figure :**

Δ ABC is the image of Δ DEC which is right-angled at C by rotation about C with an angle of measure ....



(a) 90° (b) – 90°

(c) 180° (d) 360°

2 Complete :

1 The ray drawn parallel to one side of a triangle and passing through the midpoint of another side ....

2 (– 5 , 1) is the image of the point (5 , 1) by reflection in .... axis.

3 If two adjacent sides are equal in length in a parallelogram , then it becomes ....

4 Sum of measures of the exterior angles of any convex polygon = ...

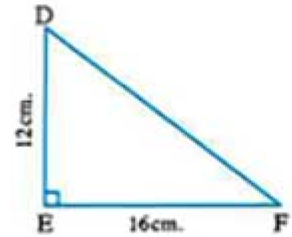
5 In Δ LMN if m (∠ M) = 90° , then $(LM)^2$ = ...

3 **[a] In the opposite figure :**

EDF is a right-angled triangle at E , DE = 12 cm.

, EF = 16 cm.

Find : DF

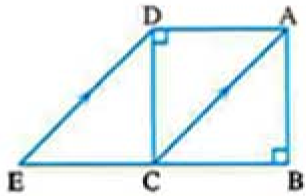


[b] In the opposite figure :

ABCD is a square , E $\in \overleftrightarrow{BC}$

, $\overline{AC}$ // $\overline{DE}$

Prove that : ACED is a parallelogram.



4 **[a]** Using the square lattice , draw Δ ABC where A (– 4 , 2) , B (0 , 1) and C (– 1 , – 2) , then find the image of Δ ABC by rotation R (O , 180°)

[b] Find the number of sides of the regular polygon if the measure of its angle = 144°

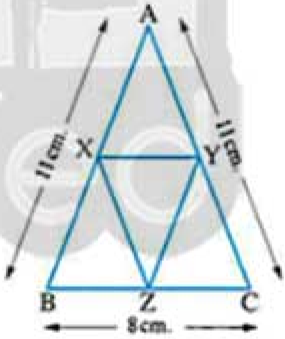
5 **[a]** Using the square lattice , draw Δ ABC where A (– 1 , 3) , B (2 , 1) and C (4 , 5) , then find the image of Δ ABC by reflection in X-axis.

[b] In the opposite figure :

AB = 11 cm. , BC = 8 cm. , CA = 11 cm.

X , Z , Y are midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CA}$

Find perimeter of : Δ XYZ



Answers of school book models on Geometry and Measurement

Model 1

1 1 (c) 2 (a) 3 (d) 4 (b) 5 (b) 6 (b)

2

1 (2 , – 1) 2 80° 3 4

4 160° 5 180°

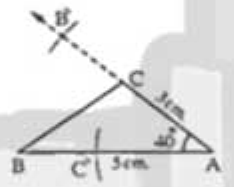
3

[a] ∵ ∠ ACD is an exterior angle of Δ ABC

∴ m (∠ ACD) = m (∠ A) + m (∠ B) = 25° + 25° = 50°

(The req.)

[b]



4

[a] ∵ M ∈ $\overline{AC}$

∴ m (∠ BMC) = 180° – 70° = 110°

∴ In Δ BMC :

m (∠ MCB) = 180° – (110° + 40°) = 30°

∴ m (∠ MCB) = m (∠ MAD)

and they are alternate angles

∴ $\overline{AD}$ // $\overline{BC}$, ∵ $\overline{AB}$ // $\overline{DC}$

∴ ABCD is a parallelogram (Q.E.D.)

[b] The point (0 , 0)

5

[a] In Δ ABD : ∵ m (∠ ADB) = 90°

∴ $(BD)^2 = (AB)^2 - (AD)^2 = 676 - 576 = 100$

∴ BD = $\sqrt{100}$ = 10 cm.

In Δ ADC : ∵ m (∠ ADC) = 90°

∴ $(CD)^2 = (AC)^2 - (AD)^2 = 900 - 576 = 324$

∴ CD = $\sqrt{324}$ = 18 cm.

∴ BC = 10 + 18 = 28 cm. (First req.)

∴ The area of Δ ABC = $\frac{1}{2}$ BC × AD

= $\frac{1}{2}$ × 28 × 24 = 336 cm²

(Second req.)

[b] ∵ ABCD is a squre

∴ $\overline{AD}$ // $\overline{BC}$, ∵ E ∈ $\overline{BC}$

∴ $\overline{AD}$ // $\overline{EC}$, ∵ $\overline{AC}$ // $\overline{DE}$

∴ ACED is a parallelogram (Q.E.D.)

Model 2

1

1 (a) 2 (c) 3 (b) 4 (c) 5 (c) 6 (d)

2

1 44 2 (5 , 5) 3 1728000

4 bisects the third side. 5 ZYC

3

[a] In Δ XYZ : ∵ m (∠ Y) = 90°

∴ $(XZ)^2 = (XY)^2 + (YZ)^2 = 49 + 576 = 625$

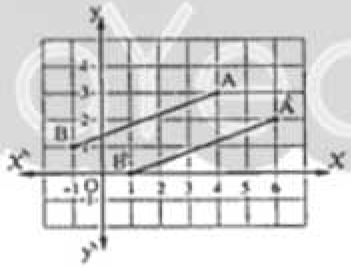
∴ XZ = $\sqrt{625}$ = 25 cm.

In Δ LXZ : ∵ m (∠ L) = 90°

∴ $(LZ)^2 = (XZ)^2 - (LX)^2 = 625 - 225 = 400$

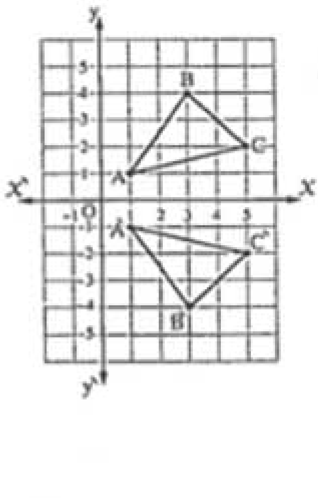
∴ LZ = $\sqrt{400}$ = 20 cm. (The req.)

[b]



4

[a]



[b] In ΔABC : m ($\angle ACB$) = 180° – (90° + 30°) = 60°

, ∵ $\overline{BD} \cap \overline{AO} = \{C\}$

∴ m ($\angle ACB$) = m ($\angle OCD$) = 60° (V.O.A)

∴ m ($\angle E$) = 360° – (60° + 120° + 90°) = 90° (The req.)

5

[a] ∵ $\overleftrightarrow{EO} \parallel \overleftrightarrow{CD}$, $\overleftrightarrow{EB}$ is a transversal

∴ m ($\angle CBA$) = m ($\angle E$) = 50° (alternate angles)

From ΔABC :

m ($\angle BAC$) = 180° – (50° + 30°) = 100°

∵ $\angle ABD$ is an exterior angle of ΔABC

∴ m ($\angle ABD$) = 30° + 100° = 130° (The req.)

[b] ∵ $\overline{AD} \parallel \overline{XY} \parallel \overline{BC}$, ∵ AX = XB

∴ DY = YC

∴ Y is the midpoint of $\overline{CD}$

In ΔCDE : ∵ $\overline{ZY} \parallel \overline{DE}$

, Y is the midpoint of $\overline{CD}$

∴ Z is the midpoint of $\overline{CE}$

∴ CZ = ZE (Q.E.D.)

Model examination for the merge students

1
1. c
2. b
3. b
4. a
5. b

2
1. half
2. right
3. 6
4. (3 , – 2)
5. 70°

3
1. ✗
2. ✗
3. ✓
4. ✗
5. ✓

4
1. 360°
2. 120°
3. (4 , 0)
4. (– 1 , – 3)
5. 45°

5 Fig (1) : $X = 8$

Fig (2) : $X = 90°$

Answers of schools examinations on Geometry and Measurement

1 Cairo

1

1 360° 2 equal in measure 3 90°
4 (6 , 1) 5 half

2

1 a 2 d 3 b 4 d 5 d 6 c

3

[a] ∵ $\overleftrightarrow{GH} \parallel \overline{AB}$, $\overrightarrow{AG}$ is a transversal to them

∴ m (∠ A) + m (∠ G) = 180°

(two interior angles in the same side of the transversal)

∴ m (∠ A) = 180° − 135° = 45°

∵ $\overleftrightarrow{DC} \parallel \overline{AB}$, $\overrightarrow{BD}$ is a transversal to them

∴ m (∠ B) + m (∠ D) = 180°

(two interior angles in the same side of the transversal)

∴ m (∠ B) = 180° − 145° = 35°

∴ In Δ ABE :

m (∠ BEA) = 180° − (45° + 35°) = 100°

∵ $\overline{AG} \cap \overline{BD}$ = {E}

∴ m (∠ DEG) = m (∠ BEA) = 100° (The req.)

[b] In Δ ABC :

∵ E is the midpoint of $\overline{AB}$

, D is the midpoint of $\overline{AC}$

∴ DE = $\frac{1}{2}$ BC

, similarly : ME = $\frac{1}{2}$ AC

∴ DE = MC

, ME = CD

∴ DEMC is a parallelogram (Q.E.D.)

4

[a] In Δ ABC :

∵ m (∠ ACB) = 90°

∴ $(AC)^2 = (AB)^2 - (BC)^2 = (13)^2 - (12)^2 = 25$

∴ AC = $\sqrt{25}$ = 5 cm. (First req.)

, the perimeter of the figure ABCD

= 13 + 12 + 4 + 3 = 32 cm. (Second req.)

[b] In Δ ABC :

∵ D is the midpoint of $\overline{AB}$

, F is the midpoint of $\overline{BC}$

∴ AC = 2 DF = 2 × 4 = 8 cm.

, ∵ D is the midpoint of $\overline{AB}$

, E is the midpoint of $\overline{AC}$

∴ BC = 2 DE = 2 × 6 = 12 cm.

, ∵ F is the midpoint of $\overline{BC}$

, E is the midpoint of $\overline{AC}$

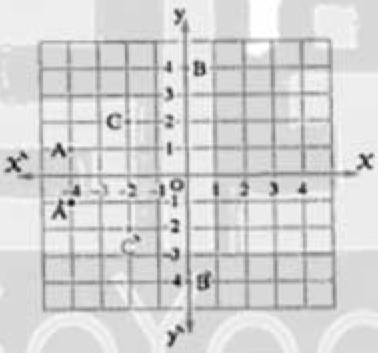
∴ AB = 2 FE = 2 × 3 = 6 cm.

∴ The perimeter of Δ ABC = 8 + 12 + 6 = 26 cm.

(The req.)

5

[a]



[b] In Δ ABC :

m (∠ ACB) = 180° − (30° + 90°) = 60°

∴ m (∠ DCF) = m (∠ ACB) = 60° (V.O.A.)

∴ From the quadrilateral CDEF :

m (∠ E) = 360° − (120° + 60° + 90°) = 90°

(The req.)

2 Cairo

1

1 b 2 d 3 a 4 a 5 d 6 c

2

1 a trapezium. 2 135°
3 (− 3 , 1) 4 9 5 130°

3

[a] In Δ ABC :

∵ D is the midpoint of $\overline{AB}$

, E is the midpoint of $\overline{AC}$

∴ $\overline{DE}$ // $\overline{BC}$, ∵ F ∈ $\overline{CB}$

∴ $\overline{DE}$ // $\overline{BF}$ (1)

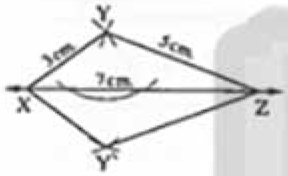
, DE = $\frac{1}{2}$ BC , ∵ BF = $\frac{1}{2}$ BC

∴ DE = BF (2)

From (1) and (2) :

∴ DFBE is a parallelogram. (Q.E.D.)

[b]



4

[a] In Δ ABC :

∵ m (∠ B) = 90°

∴ $(AC)^2 = (AB)^2 + (BC)^2$

$= (9)^2 + (12)^2 = 81 + 144 = 225$

∴ AC = $\sqrt{225}$ = 15 cm. (First req.)

, In Δ ACD

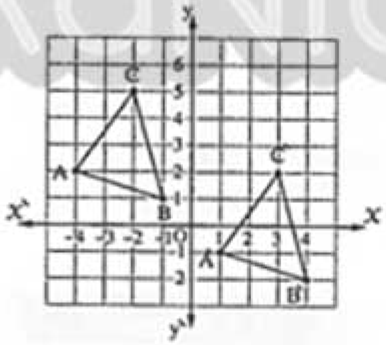
∵ m (∠ ACD) = 90°

∴ $(AD)^2 = (AC)^2 + (CD)^2$

$= (15)^2 + (20)^2 = 225 + 400 = 625$

∴ AD = $\sqrt{625}$ = 25 cm. (Second req.)

[b]



5

[a] In Δ COE :

m (∠ COE) = 180° − (50° + 35°) = 95°

∴ m (∠ BOD) = m (∠ COE) = 95° (V.O.A.)

from the quadrilateral ABOD

∴ m (∠ B) = 360° − (85° + 100° + 95°) = 80°

(The req.)

[b] ∵ $\overleftrightarrow{AC} \cap \overleftrightarrow{DE} = \{B\}$

∴ m (∠ CBE) = m (∠ ABD) = 40° (V.O.A.)

, ∵ $\overrightarrow{BE}$ bisects ∠ CBF

∴ m (∠ EBF) = m (∠ CBE) = 40°

∴ m (∠ ABF) = 180° − (40° + 40°) = 100°

(The req.)

3 Cairo

1

1 c 2 b 3 c 4 a 5 b 6 a

2

1 the third side 2 (− 2 , − 4)

3 2 4 120° 5 216

3

[a] In Δ ABC :

∵ D is the midpoint of $\overline{AB}$

, E is the midpoint of $\overline{BC}$

∴ DE = $\frac{1}{2}$ AC ∴ DE = 4 cm.

, ∵ D is the midpoint of $\overline{AB}$

, F is the midpoint of $\overline{AC}$

∴ DF = $\frac{1}{2}$ BC ∴ DF = 3.5 cm.

, ∵ F is the midpoint of $\overline{AC}$

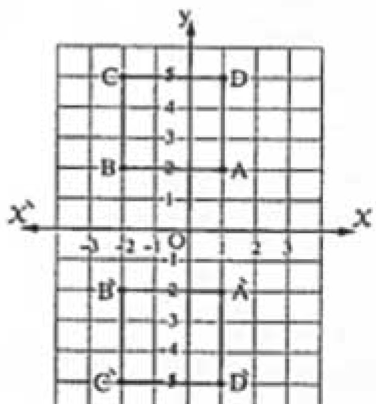
, E is the midpoint of $\overline{BC}$

∴ FE = $\frac{1}{2}$ AB ∴ FE = 2.5 cm.

∴ The perimeter of Δ DEF = 4 + 3.5 + 2.5 = 10 cm.

(The req.)

[b]



4

[a] In Δ ABC :

∵ m (∠ B) = 90°

∴ $(AC)^2 = (AB)^2 + (BC)^2 = (7)^2 + (24)^2 = 625$

∴ AC = $\sqrt{625}$ = 25 cm. (First req.)

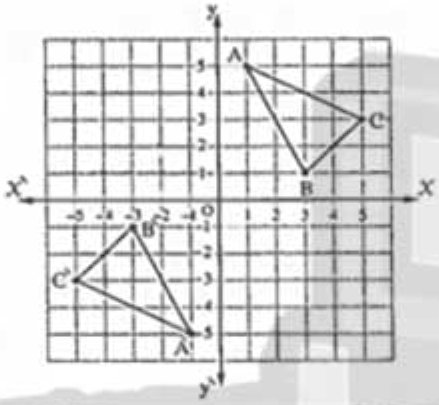
, In Δ ADC :

∵ m (∠ D) = 90°

∴ $(DC)^2 = (AC)^2 - (AD)^2 = (25)^2 - (15)^2 = 400$

∴ DC = $\sqrt{400}$ = 20 cm. (Second req.)

[b]



5

[a] In Δ ABC :

∵ m (∠ ABC) = 180° – (50° + 70°) = 60°

∴ m (∠ DBE) = m (∠ ABC) = 60° (V.O.A.)

from the quadrilateral BDFE :

∴ m (∠ E) = 360° – (60° + 130° + 90°) = 80° (The req.)

[b] ∵ ABCD is a rhombus

, $\overline{BD}$ is a diagonal

∴ m (∠ B) = 2 × 62° = 124°

∴ m (∠ A) = 180° – 124° = 56° (The req.)

4 Giza

1

1 c 2 c 3 a 4 b 5 a 6 b

2

1 180° 2 equal in measure.

3 half 4 (3 , –5) 5 (3 , 0)

3

[a] The perimeter of a regular hexagon

= 6 × 15 = 90 cm. (First req.)

the measure of each angle = $\frac{(6-2) \times 180°}{6}$

= 120° (Second req.)

[b] ∵ ABCD is a parallelogram , m (∠ B) = 120°

∴ m (∠ C) = 180° – 120° = 60°

, m (∠ D) = m (∠ B) = 120°

, AD = BC = 7 cm.

, DC = AB = 5 cm. (The req.)

4

[a] ∵ $\overline{DE}$ // $\overline{BC}$, $\overleftrightarrow{BD}$ is a transversal

∴ m (∠ B) = m (∠ D) = 50° (alternate angles)

In Δ ABC :

∴ m (∠ BAC) = 180° – (50° + 30°) = 100° (The req.)

[b] ∵ X is the midpoint of $\overline{AB}$

, Y is the midpoint of $\overline{BC}$

∴ XY = $\frac{1}{2}$ AC ∴ XY = 3 cm.

, ∵ X is the midpoint of $\overline{AB}$

, Z is the midpoint of $\overline{AC}$

∴ XZ = $\frac{1}{2}$ BC ∴ XZ = 5 cm.

, ∵ Y is the midpoint of $\overline{BC}$

, Z is the midpoint of $\overline{AC}$

∴ YZ = $\frac{1}{2}$ AB ∴ YZ = 4 cm.

∴ The perimeter of Δ XYZ = 3 + 5 + 4 = 12 cm. (The req.)

5

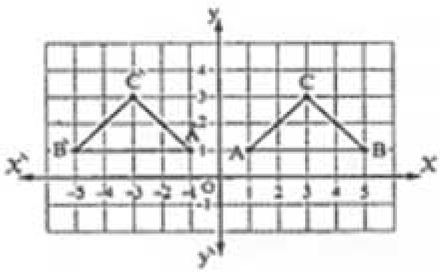
[a] In Δ ABC :

∵ m (∠ B) = 90°

∴ $(AC)^2 = (AB)^2 + (BC)^2 = (7)^2 + (24)^2 = 625$

∴ AC = $\sqrt{625}$ = 25 cm. (The req.)

[b]



5 Giza

1

1 (3 , 5) 2 bisects
3 perpendicular and bisect each other
4 360° 5 a right-angled triangle

2

1 d 2 d 3 a 4 d 5 a 6 c

3

[a] In Δ ABC :
∵ m (∠ B) = 90°
∴ $(AC)^2 = (AB)^2 + (BC)^2 = (4)^2 + (3)^2 = 25$
$AC = \sqrt{25} = 5$ cm. (First req.)
In Δ ACD :
∵ m (∠ C) = 90°
∴ $(CD)^2 = (AD)^2 - (AC)^2 = (13)^2 - (5)^2 = 144$
∴ $CD = \sqrt{144} = 12$ cm. (Second req.)

[b] ∵ ABCD is a square
∴ BC = AD
, ∵ BC = CE ∴ AD = CE (1)
∵ $\overline{BC} // \overline{AD}$, E ∈ $\overrightarrow{BC}$
∴ $\overline{CE} // \overline{AD}$ (2)
From (1) and (2) :
∴ AD = CE and $\overline{AD} // \overline{CE}$
∴ ACED is a parallelogram (First req.)
∵ $\overline{AC}$ is a diagonal in square ABCD
∴ m (∠ ACB) = 45°
∴ m (∠ E) = m (∠ ACB) = 45°
(corresponding angles) (Second req.)

4

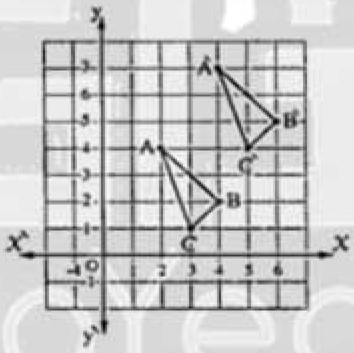
[a] In Δ ABC :
∵ X is the midpoint of $\overline{AB}$
, Y is the midpoint of $\overline{BC}$
∴ AC = 2 XY = 2 × 4 = 8 cm.
, ∵ X is the midpoint of $\overline{AB}$
, Z is the midpoint of $\overline{CA}$
∴ BC = 2 XZ = 2 × 5 = 10 cm.
, ∵ Z is the midpoint of $\overline{CA}$
, Y is the midpoint of $\overline{BC}$
∴ AB = 2 YZ = 2 × 6 = 12 cm.
∴ The perimeter of Δ ABC = 8 + 10 + 12 = 30 cm. (The req.)

[b] In parallelogram ABCD
m (∠ BCD) = m (∠ A) = 60° (1)
, in parallelogram EBCF
m (∠ EBC) = 180° − 130° = 50° (2)
In Δ XBC :
From (1) , (2) :
m (∠ BXC) = 180° − (60° + 50°) = 70° (The req.)

5

[a] In Δ CEF :
m (∠ ECF) = m (∠ E) = m (∠ F) = 60°
∴ m (∠ BCD) = m (∠ ECF) = 60° (V.O.A.)
from the quadrilateral ABCD
∴ m (∠ D) = 360° − (80° + 120° + 60°) = 100° (The req.)

[b]



6 Alexandria

1

1 a cute
2 half the length of the third side.
3 125 4 (2 , −1) 5 120°

2

1 d 2 b 3 a 4 c 5 a 6 d

3

[a] ∵ $\overrightarrow{AB} // \overrightarrow{CD}$, $\overleftrightarrow{AC}$ is a transversal
∴ m (∠ ACD) = m (∠ A) = 50° (alternate angles)
, ∵ ∠ ACE is a right angle

$\therefore$ m (∠ ECD) = 90° – 50° = 40°

, $\because$ m (∠ E) = m (∠ ECD) = 40°

and they are alternate angles

$\therefore \overrightarrow{CD} // \overrightarrow{EF}$

, $\because \overrightarrow{AB} // \overrightarrow{CD}$ $\therefore \overrightarrow{AB} // \overrightarrow{EF}$ (Q.E.D.)

[b] (0 , 0)

4

[a] In Δ ABC :

$\because$ m (∠ B) = 90°

$\therefore (AB)^2 = (AC)^2 - (BC)^2 = 400 - 144 = 256$

$\therefore AB = \sqrt{256} = 16$ cm.

, $\because$ BD = 9 cm.

$\therefore$ AD = 16 – 9 = 7 cm. (First req.)

, $\because$ AE = 2 BC = 2 × 12 = 24 cm.

, $\because \overline{AE} // \overline{BC}$, $\overline{AB}$ is a transversal

$\therefore$ m (∠ EAB) = m (∠ B) = 90° (alternate angles)

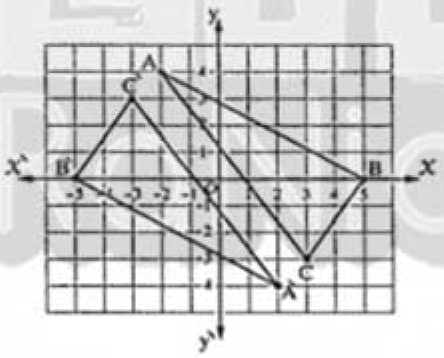
$\therefore$ In Δ EAD :

$\because$ m (∠ EAD) = 90°

$\therefore (ED)^2 = (AE)^2 + (AD)^2 = (24)^2 + (7)^2 = 625$

$\therefore ED = \sqrt{625} = 25$ cm. (Second req.)

[b]



5

[a] $\because M \in \overline{AC}$

$\therefore$ m (∠ BMC) = 180° – 70° = 110°

$\therefore$ In Δ BMC :

m (∠ MCB) = 180° – (110° + 40°) = 30°

$\therefore$ m (∠ MCB) = m (∠ MAD)

and they are alternate angles.

$\therefore \overline{AD} // \overline{BC}$

, $\because \overline{AB} // \overline{DC}$

$\therefore$ ABCD is a parallelogram. (Q.E.D.)

[b] In Δ ABC :

$\because$ D is the midpoint of $\overline{AB}$

, E is the midpoint of $\overline{BC}$

$\therefore DE = \frac{1}{2} AC$ $\therefore$ DE = 3.5 cm.

, $\because$ D is the midpoint of $\overline{AB}$

, F is the midpoint of $\overline{AC}$

$\therefore DF = \frac{1}{2} BC$ $\therefore$ DF = 4 cm.

, $\because$ E is the midpoint of $\overline{BC}$

, F is the midpoint of $\overline{AC}$

$\therefore EF = \frac{1}{2} AB$ $\therefore$ EF = 2.5 cm.

$\therefore$ The perimeter of Δ DEF

= 3.5 + 4 + 2.5 = 10 cm. (The req.)

7 Alexandria

1

1 180° 2 (4 , 2)

3 bisects the third side.

4 (2 , – 1) 5 half the length of the third side.

6 parallelogram

2

1 c 2 d 3 b 4 d 5 c

3

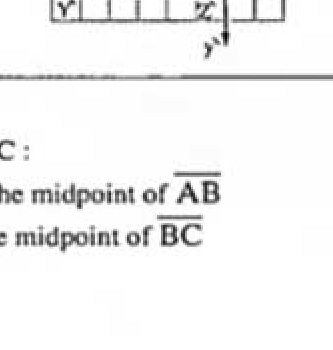
[a] In Δ ABC :

$\because$ m (∠ A) = 90°

$\therefore (AC)^2 = (CB)^2 - (AB)^2 = 100 - 36 = 64$

$\therefore AC = \sqrt{64} = 8$ cm. (The req.)

[b]



4

[a] In Δ ABC :

$\because$ D is the midpoint of $\overline{AB}$

, E is the midpoint of $\overline{BC}$

$\therefore DE = \frac{1}{2} AC$ $\qquad \therefore DE = 4$

$, \because$ D is the midpoint of $\overline{AB}$

, F is the midpoint of $\overline{AC}$

$\therefore DF = \frac{1}{2} BC$ $\qquad \therefore DF = 5$

$, \because$ E is the midpoint of $\overline{BC}$

, F is the midpoint of $\overline{AC}$

$\therefore EF = \frac{1}{2} AB$ $\qquad \therefore EF = 3.5$ cm.

$\therefore$ The perimeter of Δ FDE

$= 4 + 5 + 3.5 = 12.5$ cm. (The req.)

[b] Let the measures of the interior angles of the quadrilateral be $2X , 2X , 3X , 5X$

$\because$ the sum of the measures of the interior angles of the quadrilateral $= 360°$

$\therefore 2X + 2X + 3X + 5X = 360°$

$\therefore 12X = 360°$ $\qquad \therefore X = \frac{360°}{12} = 30°$

$\therefore$ The measure of the biggest angle $= 5 \times 30° = 150°$

(The req.)

5

[a] $(3 , -8)$

[b] In Δ ABC :

$\because \angle$ ACD is an exterior angle of Δ ABC

$\therefore m(\angle ACD) = m(\angle A) + m(\angle B)$

$= 30° + 30° = 60°$ (The req.)

8 El-Kalyoubia

1

1 b 2 b 3 d 4 c 5 d 6 b

2

1 2 2 8000 3 $(-3 , -2)$

4 140° 5 120

3

[a] In Δ ABC :

$m(\angle ABC) = 180° - (70° + 50°) = 60°$

$, m(\angle DBF) = m(\angle ABC) = 60°$ (V.O.A.)

from the quadrilateral BDEF

$\therefore m(\angle F) = 360° - (60° + 140° + 90°) = 70°$

(The req.)

[b] $\because$ D is the midpoint of $\overline{AB}$

, F is the midpoint of $\overline{AC}$

$\therefore DF = \frac{1}{2} BC = 6$ cm.

$, \because$ D is the midpoint of $\overline{AB}$

, E is the midpoint of $\overline{BC}$

$\therefore DE = \frac{1}{2} AC = 5$ cm.

$, \because CE = \frac{1}{2} BC = 6$ cm. $, CF = \frac{1}{2} AC = 5$ cm.

$\therefore$ The perimeter of DECF

$= 6 + 5 + 6 + 5 = 22$ cm. (The req.)

4

[a] $\because$ ABCD is a square $\qquad \therefore \overline{AD} \parallel \overline{BC}$

$, \because E \in \overline{BC}$ $\qquad \therefore \overline{AD} \parallel \overline{CE}$

$, \because \overline{AC} \parallel \overline{ED}$

$\therefore$ ACED is a parallelogram. (First req.)

$, \because \overline{AC}$ is a diagonal in square ABCD

$\therefore m(\angle ACB) = 45°$

$\therefore m(\angle ACE) = 180° - 45° = 135°$ (Second req.)

[b] In Δ ADC :

$\because m(\angle ADC) = 90°$

$\therefore (CD)^2 = (AC)^2 - (AD)^2 = (30)^2 - (24)^2 = 324$

$\therefore CD = \sqrt{324} = 18$ cm.

In Δ ADB :

$m(\angle ADB) = 90°$

$\therefore (BD)^2 = (AB)^2 - (AD)^2 = (26)^2 - (24)^2 = 100$

$\therefore BD = \sqrt{100} = 10$ cm.

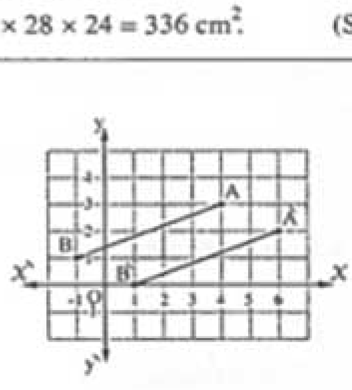
$\therefore BC = 18 + 10 = 28$ cm. (First req.)

$\therefore$ The area of Δ ABC

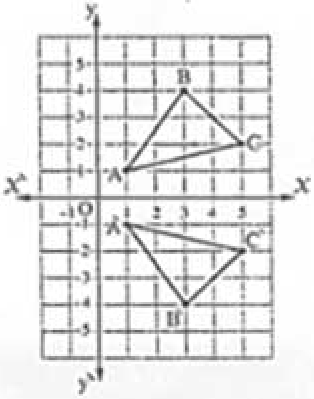
$= \frac{1}{2} \times 28 \times 24 = 336$ cm^2. (Second req.)

5

[a]



[b]



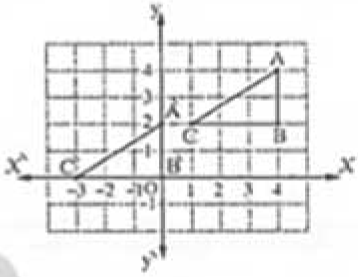
, E is the midpoint of $\overline{XZ}$

$\therefore$ OE = $\frac{1}{2}$ XY = 2.5 cm.

$\therefore$ The perimeter of Δ DOE

= 3 + 3.5 + 2.5 = 9 cm. (The req.)

[b]



9 El-Gharbia

1

1 d 2 d 3 b 4 c 5 c 6 c

2

1 parallel to the third side.

2 120

3 (– 3 , – 2)

4 equal in measure.

5 a right angle.

3

[a] $\because$ $\overrightarrow{AC} \cap \overrightarrow{DE} = \{B\}$

$\therefore$ m ($\angle$ CBE) = m ($\angle$ ABD) = 40° (V.O.A.)

$\because$ $\overrightarrow{BE}$ bisects $\angle$ CBF

$\therefore$ m ($\angle$ FBE) + m ($\angle$ EBC) = 80°

$\therefore$ m ($\angle$ FBC) = 80°

$\because$ B $\in \overleftrightarrow{AC}$

$\therefore$ m ($\angle$ ABF) = 180° – 80° = 100° (The req.)

[b] $\because$ $\overline{DE}$ // $\overline{CB}$, $\overline{BD}$ is a transversal

$\therefore$ m ($\angle$ B) = m ($\angle$ D) = 50° (alternate angles)

In Δ ABC :

m ($\angle$ BAC) = 180° – (35° + 50°) = 95° (The req.)

4

[a] In Δ XYZ :

$\because$ D is the midpoint of $\overline{XY}$

, O is the midpoint of $\overline{YZ}$

$\therefore$ DO = $\frac{1}{2}$ XZ = 3 cm.

, $\because$ D is the midpoint of $\overline{XY}$

, E is the midpoint of $\overline{XZ}$

$\therefore$ DE = $\frac{1}{2}$ YZ = 3.5 cm.

, $\because$ O is the midpoint of $\overline{YZ}$

5

[a] In Δ ABC :

$\because$ m ($\angle$ B) = 90°

$\therefore$ $(AC)^2 = (AB)^2 + (BC)^2 = (12)^2 + (9)^2 = 225$

$\therefore$ AC = $\sqrt{225}$ = 15 cm.

In Δ ACD :

$\because$ m ($\angle$ ACD) = 90°

$\therefore$ $(AD)^2 = (AC)^2 + (CD)^2 = (15)^2 + (20)^2 = 625$

$\therefore$ AD = $\sqrt{625}$ = 25 cm. (The req.)

[b] $\because$ ABCD is a square $\therefore$ $\overline{AD}$ // $\overline{BC}$

, $\because$ E $\in \overline{BC}$ $\therefore$ $\overline{AD}$ // $\overline{CE}$

, $\because$ $\overline{AC}$ // $\overline{DE}$

$\therefore$ ACED is a parallelogram. (Q.E.D.)

10 El-Dakahlia

1

1 d 2 c 3 d 4 c 5 a 6 c

2

1 120°

2 35°

3 9 cm.

4 (9 , – 6)

5 a right angle.

3

[a] In Δ ADC :

$\because$ m ($\angle$ ADC) = 90°

$\therefore$ $(CD)^2 = (AC)^2 - (AD)^2 = (30)^2 - (24)^2 = 324$

$\therefore$ CD = $\sqrt{324}$ = 18 cm.

In Δ ADB :

$\because$ m ($\angle$ ADB) = 90°

$\therefore (BD)^2 = (AB)^2 - (AD)^2 = (26)^2 - (24)^2 = 100$

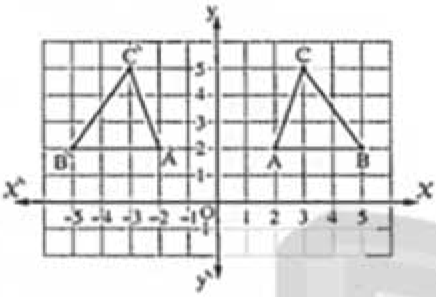
$\therefore BD = \sqrt{100} = 10$ cm.

$\therefore BC = 18 + 10 = 28$ cm. (First req.)

$\therefore$ The area of ΔABC

$= \frac{1}{2} \times 28 \times 24 = 336\ cm^2$. (Second req.)

[b]



4

[a] In ΔDEF :

$\because m(\angle DFE) = 60°$

$\therefore m(\angle CFG) = m(\angle DFE) = 60°$ (V.O.A.)

$\because$ the sum of measures of interior angles of the pentagon $= (5-2) \times 180° = 540°$

$\therefore m(\angle C) + m(\angle G)$

$= 540° - (100° + 90° + 60°) = 290°$

, $\because m(\angle C) = m(\angle G)$

$\therefore m(\angle C) = \frac{290°}{2} = 145°$ (The req.)

[b] In ΔABC :

$\because$ D is the midpoint of $\overline{AB}$

, E is the midpoint of $\overline{AC}$

$\therefore \overline{DE} \parallel \overline{BC}$, $DE = \frac{1}{2} BC = 6$ cm.

, In ΔFDE :

$\because$ X is the midpoint of $\overline{DF}$

, $\overline{XY} \parallel \overline{DE}$

$\therefore$ Y is the midpoint of $\overline{EF}$

$\therefore XY = \frac{1}{2} DE = 3$ cm. (The req.)

5

[a] $\because$ ABCD is a square

$\therefore \overline{AD} \parallel \overline{BC}$

, $\because E \in \overrightarrow{BC}$ $\therefore \overline{AD} \parallel \overline{CE}$

, $\because \overline{AC} \parallel \overline{ED}$

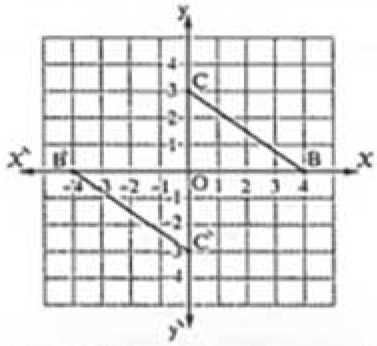
$\therefore$ ACED is a parallelogram. (First req.)

, $\because \overline{AC}$ is a diagonal in square ABCD

$\therefore m(\angle ACB) = 45°$

$\therefore m(\angle ACE) = 180° - 45° = 135°$ (Second req.)

[b]



11 Suez

1

1 b 2 b 3 d 4 b 5 d 6 c

2

1 140°

2 bisects the third side.

3 (1 , 2)

4 540°

5 $\overline{AC} \perp \overline{BD}$

3

[a] $m(\angle ABE) = 180° - 116° = 64°$

, $\because \overline{BD}$ bisects $\angle ABE$

$\therefore m(\angle ABD) = \frac{1}{2} m(\angle ABE) = 32°$ (The req.)

[b] $m(\angle DBE) = 360° - (110° + 35° + 140°) = 75°$ (The req.)

4

[a] $\because \overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$, $\overleftrightarrow{AC}$ is a transversal

$\therefore m(\angle ACD) = m(\angle A) = 50°$ (1) (alternate angles)

, $\because \overleftrightarrow{CD} \parallel \overleftrightarrow{EF}$, $\overleftrightarrow{CE}$ is a transversal

$\therefore m(\angle ECD) = m(\angle E) = 40°$ (2) (alternate angles)

From (1) , (2) :

$\therefore m(\angle ACE) = m(\angle ACD) + m(\angle ECD)$

$= 50° + 40° = 90°$ (The req.)

[b] In ΔABC :

$\because m(\angle B) = 90°$

$\therefore (AC)^2 = (AB)^2 + (BC)^2 = (6)^2 + (8)^2$

$= 36 + 64 = 100$

$\therefore AC = \sqrt{100} = 10$ cm. (The req.)

5

[a] 1 (– 2 , 3) 2 (– 3 , – 2)

3 (– 3 , – 2) 4 3

[b] In Δ ABC :

m (∠ ACB) = 180° – (60° + 90°) = 30°

∴ m (∠ DCF) = m (∠ ACB) = 30° (V.O.A.)

∴ in the polygon CDEF :

m (∠ E) = 360° – (30° + 120° + 90°) = 120°

(The req.)

12 Port Said

1

1 b 2 c 3 b 4 b 5 b 6 d

2

1 $\frac{1}{2}$ 2 (3 , –2) 3 360°

4 120° 5 6

3

[a] In Δ ABC :

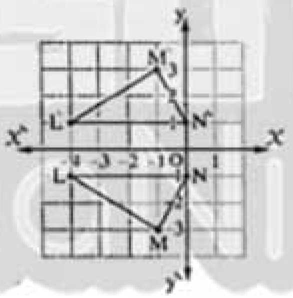
∵ m (∠ B) = 90°

∴ $(AC)^2 = (AB)^2 + (BC)^2$

$= (3)^2 + (4)^2 = 9 + 16 = 25$

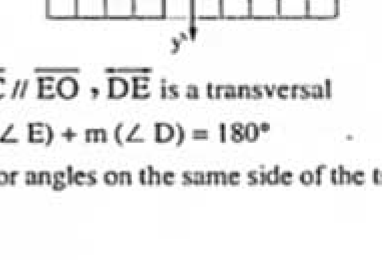
∴ AC = $\sqrt{25}$ = 5 cm. (The req.)

[b]



4

[a]



[b] ∵ $\overline{DC}$ // $\overline{EO}$, $\overleftrightarrow{DE}$ is a transversal

∴ m (∠ E) + m (∠ D) = 180°

(interior angles on the same side of the transversal)

∴ m (∠ E) = 180° – 90° = 90°

∴ m (∠ C) = 360° – (120° + 90° + 90°) = 60°

(The req.)

5

[a] In Δ ABC :

∵ D is the midpoint of $\overline{AB}$

, E is the midpoint of $\overline{AC}$

∴ CB = 2 ED = 16 cm. (The req.)

[b] ∵ ∠ ACD is an exterior angle of Δ ABC

∴ m (∠ ACD) = 25° + 25° = 50° (The req.)

13 Kafr El-Sheikh

1

1 c 2 b 3 b 4 c 5 d 6 b

2

1 (1 , 1) 2 a square 3 (1 , –2)

4 half 5 28

3

[a] From the pentagon ABCDE

m (∠ A) + m (∠ B) + m (∠ C) + m (∠ D) + m (∠ DEA) = 540°

∴ m (∠ C) = 540° – (110° + 120° + 90° + 115°)

= 105° (The req.)

[b] ∵ $\overleftrightarrow{ED}$ // $\overline{BC}$, $\overleftrightarrow{EC}$ is a transversal

∴ m (∠ C) + m (∠ E) = 180°

(interior angles on the same side of the transversal)

∴ m (∠ C) = 180° – 110° = 70°

, ∵ $\overleftrightarrow{FH}$ // $\overline{BC}$, $\overleftrightarrow{FB}$ is a transversal

∴ m (∠ B) + m (∠ F) = 180°

(interior angles on the same side of the transversal)

∴ m (∠ B) = 180° – 130° = 50°

∴ In Δ ABC :

m (∠ BAC) = 180° – (70° + 50°) = 60° (The req.)

4

[a] In Δ ABC :

∵ m (∠ B) = 90°

∴ $(AC)^2 = (AB)^2 + (BC)^2 = (7)^2 + (24)^2 = 625$

$\therefore AC = \sqrt{625} = 25$ cm. (First req.)

In ΔACD :

$\because m(\angle D) = 90°$

$\therefore (DC)^2 = (AC)^2 - (AD)^2 = (25)^2 - (15)^2 = 400$

$\therefore DC = \sqrt{400} = 20$ cm. (Second req.)

[b] In ΔABC :

$\because$ X is the midpoint of $\overline{AB}$

, Y is the midpoint of $\overline{AC}$

$\therefore XY = \frac{1}{2} BC = 4$ cm.

, $\because$ X is the midpoint of $\overline{AB}$

, Z is the midpoint of $\overline{BC}$

$\therefore XZ = \frac{1}{2} AC = 4$ cm.

, $\because$ Y is the midpoint of $\overline{AC}$

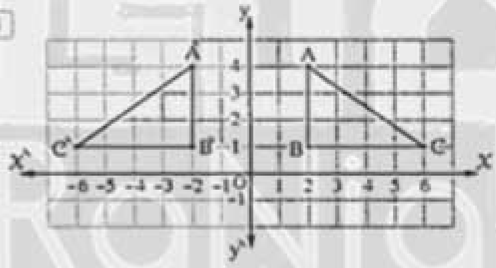
, Z is the midpoint of $\overline{BC}$

$\therefore YZ = \frac{1}{2} AB = 3$ cm.

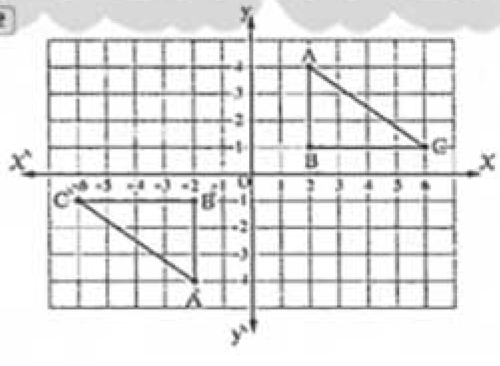
$\therefore$ The perimeter of $\Delta XYZ = 4 + 4 + 3 = 11$ cm. (The req.)

5

[a] 1



2



[b] $\because E \in \overrightarrow{CD}$

$\therefore m(\angle ADC) = 180° - 60° = 120°$

, $\because$ ABCD is a parallelogram

$\therefore m(\angle B) = m(\angle ADC) = 120°$ (The req.)

14 Beni Suef

1

1 c 2 a 3 c 4 c 5 c 6 d

2

1 equal in length. 2 bisects the third side.

3 the sum of areas of the squares on the sides of the right angle.

4 ΔZYC 5 equal in measure.

3

[a] $\because m(\angle EAC) + m(\angle BAC) + m(\angle EAB) = 360°$

$\therefore m(\angle BAC) = 360° - (130° + 90°) = 140°$ (First req.)

, $\because \overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$, $\overleftrightarrow{AC}$ is a transversal to them.

$\therefore m(\angle C) + m(\angle CAB) = 180°$

(Two interior angles in the same side of the transversal)

$\therefore m(\angle C) = 180° - 140° = 40°$ (Second req.)

[b] $\because$ ABCD is a rhombus , $\overline{AC}$ is a diagonal

$\therefore m(\angle BCD) = 2 \times 32° = 64°$

$\therefore m(\angle D) = 180° - 64° = 116°$ (The req.)

4

[a] In ΔABC :

$\because$ D is the midpoint of $\overline{AB}$

, E is the midpoint of $\overline{AC}$

$\therefore BC = 2\,DE = 2 \times 4 = 8$ cm.

, $BD = AD = 3$ cm.

, $CE = AE = 2$ cm.

$\therefore$ The perimeter of DBCE

$= 3 + 8 + 2 + 4 = 17$ cm. (The req.)

[b] In ΔADC :

$\because m(\angle ADC) = 90°$

$\therefore (AD)^2 = (AC)^2 - (CD)^2$

$= (20)^2 - (16)^2 = 144$

$\therefore AD = \sqrt{144} = 12$ cm. (First req.)

In ΔADB : $\because m(\angle ADB) = 90°$

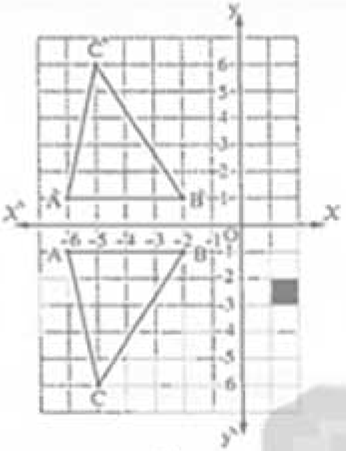
$\therefore (AB)^2 = (AD)^2 + (BD)^2$

$= (12)^2 + (9)^2 = 225$

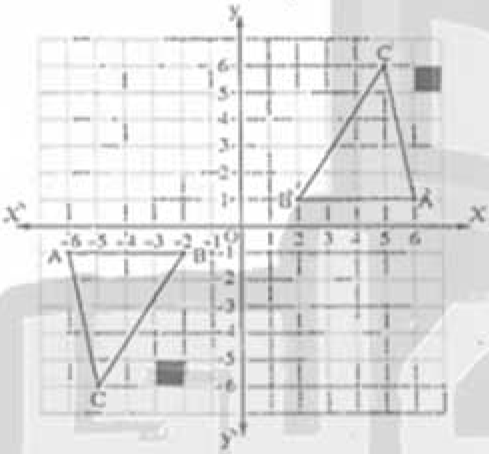
$\therefore AB = \sqrt{225} = 15$ cm. (Second req.)

5

1



2



15 Souhag

1

1 c 2 c 3 c 4 d 5 a 6 a

2

1 parallel to the third side , equal to half of its length.

2 15 3 $(-2, -1)$

4 Y 5 bisects the third side.

3

[a] In Δ ABC :

$\because$ X is the midpoint of $\overline{AB}$

, Y is the midpoint of $\overline{AC}$

$\therefore$ XY $= \frac{1}{2}$ BC $= 4.5$ cm.

, $\because$ X is the midpoint of $\overline{AB}$

, Z is the midpoint of $\overline{BC}$

$\therefore$ XZ $= \frac{1}{2}$ AC $= 5$ cm.

, $\because$ Y is the midpoint of $\overline{AC}$

, Z is the midpoint of $\overline{BC}$

$\therefore$ YZ $= \frac{1}{2}$ AB $= 3.5$ cm.

$\therefore$ The perimeter of Δ XYZ $= 4.5 + 5 + 3.5$

$= 13$ cm. (The req.)

[b] $\because \overline{DE} \parallel \overline{CB}$, $\overline{BD}$ is a transversal

$\therefore$ m ($\angle$ B) = m ($\angle$ D) = 60° (alternate angles)

$\because \angle$ DAC is an exterior angle of Δ ABC

$\therefore$ m ($\angle$ DAC) = 50° + 60° = 110° (The req.)

4

[a] $\because \overline{DA} \parallel \overline{CB}$, $\overline{AB}$ is a transversal

$\therefore$ m ($\angle$ B) = m ($\angle$ EAB) = 120°

(alternate angles)

$\therefore$ m ($\angle$ B) + m ($\angle$ C) = 120° + 60° = 180°

and they are interior angles on the same side of the transversal

$\therefore \overline{AB} \parallel \overline{CD}$

, $\because \overline{AD} \parallel \overline{BC}$

$\therefore$ ABCD is a parallelogram (Q.E.D)

[b] In Δ ABC :

$\because$ m ($\angle$ B) = 90°

$\therefore (AC)^2 = (AB)^2 + (BC)^2 = (3)^2 + (4)^2 = 25$

$\therefore AC = \sqrt{25} = 5$ cm. (First req.)

In Δ ACD :

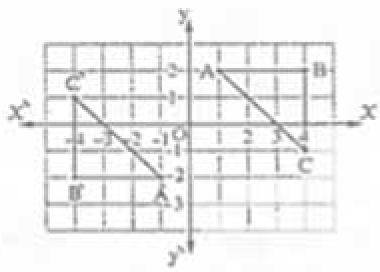
$\because$ m ($\angle$ ACD) = 90°

$\therefore (CD)^2 = (AD)^2 - (AC)^2 = (13)^2 - (5)^2 = 144$

$\therefore CD = \sqrt{144} = 12$ cm. (Second req.)

5

[a]



[b] 1 CBM 2 MCD

3 CDM 4 DEM